MIDDLE RIO GRANDE PROJECT, NEW MEXICO

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HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON PUBLIC WORKS UNITED STATES SENATE

EIGHTY-FIFTH CONGRESS

SECOND SESSION

ON

S. 2975

A BILL TO AUTHORIZE THE MODIFICATION OF THE PROJECT FOR THE RIO GRANDE BASIN IN ORDER TO PROVIDE FOR THE COMPLETION OF THE MIDDLE RIO GRANDE PORTION OF SUCH PROJECT

JULY 10 AND 11, 1958

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MIDDLE RIO GRANDE PROJECT, NEW MEXICO

THURSDAY, JULY 10, 1958

UNITED STATES SENATE,
COMMITTEE ON PUBLIC WORKS,
SUBCOMMITTEE ON RIVERS AND HARBORS—FLOOD CONTROL,
Washington, D. C.

The subcommittee met, at 10 a. m., in room 412, Senate Office Building, the Honorable Dennis Chavez (chairman of the committee) presiding.

Present: Senators Chavez, Church, Jordan, and Hruska.

The CHAIRMAN. The committee will come to order.

It happens that members of this committee belong to other committees and the Congress is working at high pressure. So if you witnesses present don't see many of them do not feel that they are not interested, because they are. We will try to make a record for future action.

The bill that we are going to consider today is Senate bill 2975, and it would authorize modification of the project for the Rio Grande Basin in order to provide for the completion of the middle Rio Grande portion of such project.

The middle Rio Grande project was planned and authorized for partial construction by the Corps of Engineers and the Bureau of Reclamation by the Flood Control Acts of 1948 and 1950.

The Corps of Engineers made recommendations in House Document 243, 81st Congress, 1st session, that the following works for flood control be constructed:

(*a*) Chiflo Dam and Reservoir on the Rio Grande (storage capacity, 816,000 acre-feet).

(*b*) Chamita Dam and Reservoir on the Rio Chama (storage capacity, 945,000 acre-feet).

(*c*) Jemez Canyon Dam and Reservoir on the Rio Jemez (storage capacity, 120,000 acre-feet).

(*d*) Rio Grande Floodway through Espanola and middle valley including levees and channel improvement at Albuquerque.

(*e*) Bluewater Floodway on Bluewater Creek.

The recommendations of the Corps of Engineers were not acceptable in full to the people residing below Elephant Butte Dam in New Mexico, nor to Texas and Colorado. An agreement was reached during the hearings which were begun on May 17, 1948, which provided the following limitations on the project as recommended:

(*a*) Construction of the spillway gate structure at Chamita Dam shall be deferred so long as New Mexico shall have accrued debits, as defined by the Rio Grande compact and until New Mexico shall consistently accrue credits pursuant to the Rio Grande compact.

(*b*) Chiflo Dam and Reservoir on the Rio Grande shall be excluded from the authorized middle Rio Grande project without prejudice to subsequent consideration by Congress.

(*c*) At all times when New Mexico shall have accrued debits as defined by the Rio Grande compact, all reservoirs constructed as a part of the project shall be operated solely for flood control, except as otherwise required by the Rio Grande compact, and at all times all project works shall be operated in conformity with the Rio Grande compact as administered by the Rio Grande Compact Commission.

A representative of the Corps of Engineers in commenting on the agreement, stated:

> Speaking for the Chief of Engineers with reference to the compromise agreement which has been discussed recently here by the States, we see no objection to the agreement as now drawn and as now included in the bill before the committee, and we believe that the plan, as proposed, can operate to provide partial flood-protection benefits to the middle valley entirely in accordance with the provisions of the Rio Grande compact.

The Bureau of Reclamation was authorized by the Flood Control Acts of 1948 and 1950 to make improvements to irrigation and drainage works, channel rectification, rehabilitation of irrigated areas, and to make studies and carry on work designed to reduce nonbeneficial consumptive use of water by native vegetation in the flood plains of the Rio Grande and its tributaries above Caballo Dam. In addition, improvement of irrigation works on Indian pueblo lands was authorized.

The authorized improvements have been carried forward during the past several years. Jemez Dam has been completed. Construction has been started on the authorized work on the Rio Chama which is referred to as the Abiquiu Dam. It was concluded by the Corps of Engineers that control of the Rio Chama could be accomplished by a relatively low dam at the Chamita site and a high dam at the Abiquiu site, at a lesser cost than the high dam at Chamita, as proposed in the plan as authorized. Levee improvements have been made in the vicinity of Albuquerque. There are additional reaches of the river on which improvements have been authorized; however, this work has not been started.

Channelization work has been carried on by the Bureau of Reclamation and many miles of canals and drains have been rehabilitated, as well as a program of channelization and water salvage. Rehabilitation of Indian irrigation ditches has also been started.

A committee resolution was adopted and transmitted to the Corps of Engineers on June 28, 1956, requesting a review to determine whether any additions or modifications should be made in the recommendation of the Corps of Engineers, as contained in House Document 243, 81st Congress, first session. Since then studies have been conducted to determine the feasibility of developing a more desirable and economic system of flood-control and sediment-control projects within the authorized plan of development and conditions of the Rio Grande compact. The Corps of Engineers has indicated that the plan as approved by Congress in the 1948 and 1950 Flood Control Acts, does not provide adequate flood protection and sediment control in the valley of the middle Rio Grande. They have indicated that the lack of capacity for detention of floodwater is the key weakness in the authorized plan.

The Corps of Engineers has completed a field draft of a plan which would, in their opinion, carry out the original purpose of providing flood and sediment protection to the valley. The report has not officially been submitted to Congress, nor has it been reviewed by the affected States. However, field hearings have been held by the Corps of Engineers and they have had expressions from those interested in the project.

The representatives of the Corps of Engineers and the Bureau of Reclamation have been requested to appear before the Subcommittee on Rivers and Harbors and Flood Control (1) to describe the work which has been carried on to date under the authorized plan, (2) to describe the additional works which remain to be completed under the authorized plan; (3) to discuss those works of improvement which the two agencies feel are needed to provide the degree of flood protection and sediment control that is necessary; and (4) to outline the rehabilitation of irrigations works, both for Indian and non-Indian lands and improvement of drainage systems needed in the middle Rio Grande Valley.

We will put the bill in the record at this point.

(S. 2975 follows:)

[S. 2975, 85th Cong., 2d sess.]

A BILL To authorize the modification of the project for the Rio Grande Basin in order to provide for the completion of the Middle Rio Grande portion of such project

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the project for the Rio Grande Basin, as authorized in the Flood Control Act of 1948, is modified in order to authorize the completion of all portions of the Middle Rio Grande project recommended by the Chief of Engineers in his report dated April 5, 1948, contained in House Document Numbered 243, Eighty-first Congress.

The CHAIRMAN. We have with us today Gen. John L. Person, Corps of Engineers; Mr. Floyd Dominy, Associate Commissioner of Bureau of Reclamation; Mr. John C. Thompson, Bureau of Reclamation, Albuquerque, N. Mex.; William Miller, Chief of Irrigation Division, Bureau of Indian Affairs; Mr. Steve Reynolds, State engineer of New Mexico; Mr. Hubert Ball, chief engineer, Middle Rio Grande Conservancy District, Albuquerque, N. Mex.; Mr. John P. Murphy, secretary, Middle Rio Grande Flood Control Association; Mr. R. M. Dixon, Texas Board of Water Engineers; Mr. Louis A. Scott, Texas Commission-Rio Grande Compact; Mr. N. B. Phillips, El Paso County Water Improvement District; Mr. Frank J. Dailey, mayor, Socorro, N. Mex.; Mr. John L. Gregg, Elephant Butte Irrigation District; Mr. William Cater, Cerro, N. Mex.; Mr. Phil Maestas, State senator, Espanola, N. Mex., manager, Santa Cruz Irrigation District and member of Middle Rio Grande Flood Control Association; Mr. Edmund Engle, city manager, Albuquerque, N. Mex., and Andres Martinez, Taos, N. Mex.

General Person? Of course you understand what this is about.

STATEMENT OF BRIG. GEN. JOHN L. PERSON, ASSISTANT CHIEF OF ENGINEERS FOR CIVIL WORKS, OFFICE OF CHIEF OF ENGINEERS

General PERSON. Yes, sir.

The CHAIRMAN. You heard the introductory remarks that I made. Can you discuss the subject matter of the statement that I made?

General PERSON. Yes, sir; I can.

For the record, I am Brig. Gen. J. L. Person, Assistant Chief of Engineers for Civil Works, Office of Chief of Engineers.

I would like to refer briefly to the report by the Secretary of the Army submitted to the committee on April 1, in which he points out that the Department of the Army has underway a review of House Document 243, 81st Congress, in response to the resolution adopted by this committee on June 28, 1956.

Consideration is being given in the review to reservoir sites which would provide storage for flood control and sediment detention. The storage in the reservoir is being considered as alternative to and would be substituted for the storage that would be provided by the Chiflo Dam and Reservoir project. The studies are complete by the district. They have not yet been reviewed by the division or by my office, or by the Board of Engineers, Rivers and Harbors, but I could discuss briefly the authorized plan, what has been accomplished on it, and the findings that the district has made. They may be changed in the course of review, but it might be of interest to the committee to know what their thinking is.

The CHAIRMAN. I wish you would.

General PERSON. As the chairman has so ably presented, the recommendations in House Document 243 included Jemez Canyon Dam on Jemez Creek, Chamita Dam, the Chiflo Dam, Rio Grande Floodway, and Bluewater Floodway, and by agreement between the Department of the Army and Department of the Interior, the Corps of Engineers was responsible for building the three reservoirs and rehabilitating and constructing the levees for the floodway. The Bureau of Reclamation was responsible for the channel rectification portion of the floodway.

As the chairman has stated, the authorizing act excluded Chiflo Dam without prejudice to its subsequent consideration by Congress. Jemez Canyon Dam has been completed. Preconstruction planning on the Chamita Dam showed a cheaper and better solution to the problem would be by construction of a low dam at the Chamita site and a high dam at Abiquiu, some 25 miles upstream. That change in the plan was approved by the Appropriations Committees of the House and Senate in 1955, and Abiquiu is under construction.

The CHAIRMAN. As a matter of fact, the bill that pased the Senate yesterday contains an item of $1,250,000 for continuing the Chamita or Abiquiu Dam.

General PERSON. Yes, sir; that is correct.

The studies which we have undertaken in response to the June 28, 1956, resolution are essential, because we must find a solution to the flood problem in the Rio Grande.

In the course of the study which is confined to the main stem above Elephant Butte Reservoir we considered various plans, including enlargement of the existing and authorized levees, control by means of upstream reservoirs, and combinations of both.

We found that the authorized reservoirs, plus a larger floodway, would be excessively costly, because the protection by means of levees increases very markedly in cost at about 20,000 cubic feet-per-second flow, because of the danger of piping at high stages requiring a very costly toe drainage system and very expensive revetment works.

Therefore, to provide the desired degree of protection by means of the authorized reservoirs, plus an enlarged floodway, would be excessively costly.

The authorized reservoirs, plus Chiflo, were studied, and it was found that the Chiflo Reservoir would reduce the standard project spring flood to within the capacity of the authorized levees. However, the large uncontrolled drainage area below Chiflo could generate a summer flood considerably greater than the capacity of existing Albuquerque levees.

The CHAIRMAN. Leaving that as it is for the moment, it would have some flood-protection features?

General PERSON. Oh, yes; definitely.

The CHAIRMAN. But you state that the drainage area below that would also be hazardous?

General PERSON. Yes, sir; that is correct.

The CHAIRMAN. That being as it is, what would you say about Chiflo in the matter of additional water for the area that is so badly needed? Wouldn't it affect the evaporation features and wouldn't it provide, say, some 100,000 acre-feet more water for the Rio Grande if it were constructed? I am not saying that it will or will not, or the cost, because if it is eventually done the cost will probably be greater. But it would have that advantage; would it not?

General PERSON. It would; yes.

Of course, as you know, there was no storage included in Chiflo except for flood control. But the retention during the period of release would add to the flow.

The CHAIRMAN. To the flow?

General PERSON. Yes, sir; with due consideration given to the rectified channel.

The CHAIRMAN. And it would alleviate the danger of evaporation?

General PERSON. Yes, sir.

The CHAIRMAN. My information is it would be to the extent of possibly 100,000 acre-feet.

General PERSON. I believe that is correct, sir.

However, we did find that that would be more costly than the plan which the district has finally submitted, which involves a reservoir at Cochiti on the main stem with a controlled outlet, and a reservoir on the Rio Galisteo, a tributary, with an uncontrolled outlet.

The CHAIRMAN. How far from the Rio Grande on the Galisteo?

General PERSON. About 4 miles upstream from the Rio Grande.

The Cochiti Dam, as envisioned by the district, would be an earth-filled structure 5.6 miles long and 260 feet high on the Rio Grande, about 50 river miles upstream from the Albuquerque, with a reservoir capacity of 597,000 acre-feet at the top of the flood-control pool, of which 105,000 acre-feet would be reserved for sediment.

The Galisteo Dam would be an earth-filled structure 2.2 miles long and 150 feet high, near Domingo, N. Mex., with about 130,000 acre-feet total storage capacity at the spillway crest, of which all but 13,000 acre-feet would be flood control, and that 13,000 acre-feet would be for sediment.

It was found that those two reservoirs, operated together, would provide, in connection with the authorized levee projects, the highest degree of protection against both spring and summer floods, and at

the least cost. And it was also quite clear that the construction sequence should, by all means, be, first, to construct Cochiti.

The CHAIRMAN. And the Bureau of Reclamation is in agreement with that proposal, if that is what should be determined?

General PERSON. I believe that they are in agreement at field level. It has not been formally submitted to them at the Washington level.

The CHAIRMAN. I understand. What about in the event the Chiflo Reservoir was constructed, eventually? What about power construction?

General PERSON. If Chiflo were constructed, it would be possible at some later date, if power were authorized, to install power, through a side tunnel, without any initial provision of penstocks.

The CHAIRMAN. From your knowledge of the water of the Rio Grande, and the power availability as of now at Elephant Butte, would you say that power potential at Chiflo would be advantageous to the general area to firm up the power at Elephant Butte?

General PERSON. I believe the power demand is increasing in that area, as it is all over the country.

The CHAIRMAN. Do you have anything further?

General PERSON. I failed to point out one thing, sir. If Cochiti and Galisteo Reservoirs are constructed, they will eliminate the need for building the low Chamita Dam.

The CHAIRMAN. Can you tell us, more or less, the progress that has been made at the Abiquiu Dam as of now?

General PERSON. Yes, sir.

The CHAIRMAN. What is your lead date on that?

General PERSON. I think it is due for completion in 1962, sir. The budget request of $1,250,000 for fiscal 1959 will bring it to about 38 percent of completion. And the completion schedule is 1962.

The CHAIRMAN. Is the date of 1962 based upon monetary reasons or working conditions?

General PERSON. Primarily, an orderly construction schedule, sir.

The CHAIRMAN. You would call the completion of the dam by 1962 "orderly"?

General PERSON. Yes, sir.

The CHAIRMAN. The way it should be done by those who know the technical end of it?

General PERSON. Yes, sir.

The CHAIRMAN. So, it is not a question, then, of lack of money?

General PERSON. No, sir.

The CHAIRMAN. I want to thank you, General.

Senator CHURCH. General, before you leave. In connection with the Cochiti Reservoir proposal and Galisteo, are these just flood-control proposals, or will there be any power facilities?

General PERSON. No power at all. No storage except flood control. There will be sedimentation storage set aside in each, but there will be no conservation or power pool.

Senator CHURCH. Is this because of the kind of dams that are planned? Is it feasible to put power facilities in these dams?

General PERSON. It might be feasible, but I don't think it would be economically justified.

Senator CHURCH. That does not necessarily apply to the upstream site of Chiflo?

General PERSON. That is correct. Power was studied—was considered, rather, in House Document 243, and it was concluded that power could be installed at a later date, if authorized, without added cost. That is, in other words, if you build it without power you can come back later and put in the power features.

The CHAIRMAN. Isn't the Chiflo Reservoir the only place in the entire State of New Mexico where we still have a little potential for power?

General PERSON. I believe it is, sir.

The CHAIRMAN. And power, as you have stated, is in greater demand daily?

General PERSON. Yes, sir.

Senator HRUSKA. General, does the report which is in process treat with Chiflo at all?

General PERSON. No, sir; except to examine the relative costs of Chiflo as originally recommended, as compared to Cochiti and Galisteo.

Senator HRUSKA. There is no construction contemplated there in the scope of your report?

General PERSON. That's right. Cochiti and Galisteo Reservoirs, when built, would take the place of Chiflo.

The CHAIRMAN. I wish in that same report that the Army engineers would give us the report and study of the power potentials of Chiflo, even if your recommendation is to build Galisteo and Cochiti Dams. You surely have made some studies here before, because you have reported that it had power potential?

General PERSON. Yes, sir; that was reported in House Document 243.

The CHAIRMAN. I wish you would review that document and any other information you have to see if the committee can have that information for future use.

General PERSON. Very well, sir.

The CHAIRMAN. Below Albuquerque, below Belen, and on toward Socorro, you have the Rio Puerco and the Rio Salado, which carry a tremendous amount of sediment. Has any study been made as to those?

General PERSON. Not as yet. The studies are contemplated.

The CHAIRMAN. The House document also refers to those?

General PERSON. Yes, sir.

The CHAIRMAN. The House document and the bills that were passed in 1948 and 1950 also have the Bluewater Floodway?

General PERSON. Yes, sir.

The CHAIRMAN. What have you done about that?

General PERSON. Bluewater Floodway is in a deferred status; rather, it is not deferred; it is simply that we have had no funds appropriated for it as yet.

The CHAIRMAN. It is a question of funds?

General PERSON. Yes, sir. The total estimated cost of that floodway is $450,000.

The CHAIRMAN. $450,000?

General PERSON. Yes, sir.

The CHAIRMAN. If you had the funds, you could go ahead?

General PERSON. Yes, sir.

The CHAIRMAN. That is important.

Senator HRUSKA. General, will the construction of the dams at Gallisteo and Cochiti take care of the flood situation from there upstream? Will that afford ample flood protection?

General PERSON. You see, sir, the floodway is at Espanola. That is authorized; the floodway and levees. Those levees and floodway will take care of the problem above Espanola. Of course, they will not be affected by Cochiti and Galisteo.

The CHAIRMAN. Will Chiflo Reservoir have any flood-protection value with the downstream structures which are authorized and which will be built?

General PERSON. Yes, sir. Chiflo was originally conceived to be built in connection with the floodway construction. That was our initial recommendation.

The CHAIRMAN. So Chiflo would have this advantage: It would provide flood protection, it would have power production, and it would add additional waters that are badly needed. Is that correct?

General PERSON. That is correct.

The CHAIRMAN. The reason we are concerned, we have so little water that we can't afford to waste one drop. That is why we are interested. We know that Chiflo Reservoir is costly; we know that we can't create it unless we have power; we know that we can't have protection unless we go through some costs; and we can't have additional waterways without some costs. And that is the interest of the people of New Mexico in Chiflo.

Thank you, General.

Are there any further questions?

If not, we will next hear Mr. Floyd Dominy.

I would like to have Mr. Miller, of the Indian Bureau, come to the table.

STATEMENT OF FLOYD E. DOMINY, ASSOCIATE COMMISSIONER, BUREAU OF RECLAMATION; ACCOMPANIED BY JOHN THOMPSON, PROJECT HEAD, MIDDLE RIO GRANDE PROJECT; AND WILLIAM MILLER, CHIEF, INDIAN IRRIGATION DIVISION, BUREAU OF INDIAN AFFAIRS

Mr. DOMINY. I am Floyd E. Dominy, Associate Commissioner of the Bureau of Reclamation. I am pleased to have the opportunity to appear here and to report Reclamation's activities in this middle Rio Grande section of the river and to comment on some of the problems with which we are confronted.

I have with me this morning Mr. John Thompson, who is our project head of the middle Rio Grande project, and also at your request we have Mr. William Miller, Chief of the Indian Irrigation Division for the Bureau of Indian Affairs.

As General Person has stated to you, the Bureau of Reclamation's authorized work on the middle Rio Grande project covers channelization and rehabilitation of the conservancy's district's irrigation and drainage systems.

The first work undertaken by the Bureau was the emergency water salvage channelization through the San Marcial area.

The CHAIRMAN. This is where you have the salt cedars and a natural dam built up by sediment?

Mr. DOMINY. That's right, sir. The salt cedars had pretty well plugged the natural channels of the river so when the waters came down they were spreading out over wide areas of valueless land and absorbing great quantities of water.

The CHAIRMAN. As I recall, it was estimated that the people below the dam were missing something like 110,000 acre-feet a year due to that condition.

Mr. DOMINY. Yes, sir. As a matter of fact, Mr. Chairman, this work that we started in 1952, and completed in 1954, covered the reach of the river of about 35 miles long, and it has functioned above our expectations in the salvage of water.

We have had water salvage through September 1957 by the completed channelization totaling about 350,000 acre-feet.

The CHAIRMAN. That water did not inure to the benefit of the middle Rio Grande but it did inure to the benefit of the Rio Grande District below Elephant Butte.

Mr. DOMINY. Yes, sir; it went on down to Elephant Butte and augmented their very limited storage which they had during those dry years.

The entire channelization plan, when completed, we think will save about 100,000 acre-feet of water annually, a figure which you just quoted.

Added to this will be approximately 70,000 acre-feet of water which we think will be saved by rehabilitation of the district's drainage and irrigation system, from the rehabilitation work that we are doing, and by construction of water salvage works under a cooperative program with the State of New Mexico.

I might say at this point that we have had excellent cooperation with the Middle Rio Grande District and with the State of New Mexico in carrying out this program. The Bureau has enjoyed the fullest cooperation from the New Mexico people. The conservancy district officials have supported our program to the fullest and have given freely of their time and counsel in assisting us with our problems.

The State has provided funds and equipment for supplemental water salvage measures and have worked closely with us on all water problems, particularly those dealing with operation of reservoirs under our direction.

The rehabilitation of the drainage system on the middle Rio Grande project was begun in fiscal year 1954, and we actually started work on the rehabilitation of the irrigation system in fiscal year 1955.

A modified channel rectification plan was developed that provides for optimum water salvage along with the authorized purposes of channel degradation, flood protection, and minimization of floodway maintenance costs. The major features of this plan include substitution of a permanent low-flow conveyance canal protected by a levee and a cleared floodway through the San Marcial reach in lieu of the originally contemplated dredged channel; extension of this same general type of channel through the Socorro and Bernardo areas; and a varying width cleared channel through the middle valley—Rio Puerco-Cochiti—defined by steel jetties.

Consideration was given to the hazards of flood damage to channel rectification works, if we constructed the channel rectification works prior to completion of upstream flood storage. It was concluded the urgency of achievement of the benefits to be derived merited immediate initiation of the work and its accomplishment at the most practicable construction rate.

We recognize that if we get maximum flow of record without the upstream storage, that there would be flood damage and that the channel rectification work alone would not suffice to prevent that damage. But we did recognize that the need for this channel work was of great urgency and we had to take, in our judgment, that calculated risk and go ahead with it.

On this basis, the modified channel rectification program was initiated in fiscal year 1956.

Following is a summary of the construction accomplished to date and contemplated.

Work accomplished to date; drainage and irrigation system rehabilitation and improvement:

About 400 miles of drains have been cleaned, cleared of brush, deepened and provided adequate access roads, and bridges, and culverts. The drainage system has been modified as appropriate to provide for optimum salvage of drainage flows for irrigation use. It is considered that the drainage construction is complete.

Rehabilitation of the irrigation system has included repairs and modification of the El Vado storage dam, and the four diversion dams of the project. Approximately 100 miles of laterals have been rehabilitated. This work consisted of replacing wooden structures with new concrete structures, cleaning and enlarging and building access roads.

As part of the rehabilitation work, the district's bonds were acquired at a cost to the Government of $5,300,000.

The total cost of the drainage and irrigation system work accomplished to date is about $15 million, including cost of bond acquisition.

The CHAIRMAN. Speaking of the money end of it, inasmuch as it was a Bureau proposition, as I recall—and I want you to verify the facts if I state them correctly—about $42 million was contemplated to be spent by the Army engineers in their function, and about $30 million by the Bureau of Reclamation. Are those figures correct?

Mr. DOMINY. Yes, those are the original estimated costs. On the part that we spent on rehabilitation and drainage, that is reimbursed by the district, including the money which we advanced to them to retire bonds. That is all repaid under general reclamation law principles and the work we do on the river, the channelization work, related to the Army's flood-control work, is nonreimbursable under the authorization.

Channel rectification:

The channel rectification work completed or under contract at the end of fiscal year 1958 includes the following major items:

1. Eighty-two miles of channelization through the San Marcial, Socorro, and Bernardo areas. This work consisted essentially of a low-flow channel of 2,000 cubic feet per second capacity which will handle the river flows 85 percent of the time; a spoil-bank levee on the east side of the channel protected by a brush fringe and/or steel

jetty installations; and a cleared floodway ranging in capacity from 25,000 to 60,000 cubic feet per second to handle flood flows.

2. Through the Espanola area 20 miles of major channelization consisting of a cleared floodway 400 feet wide, pilot channels and river cutoffs to straighten the river and to minimize erosion of agricultural lands.

3. Twenty-one miles of minor water salvage channels in the San Antonio, Escondida, and La Joya areas which are designed to minimize overflow of large areas of native vegetation and to lower the water table through the areas.

The CHAIRMAN. What about the area across the river from San Antonio, old San Pedro and down?

Mr. DOMINY. Would you like to comment on that, Mr. Thompson?

Mr. THOMPSON. Yes. That is included in this San Antonio water salvage channel, 7 miles of that. It prevents inundation of an area of about 2,500 acres in that particular reach.

Mr. DOMINY. Then we put in 4 miles of a prototype channel in the Belen area to test the effectiveness of the proposed installation for an approximate 100-mile reach of river in the Rio Puerco-Cochiti unit. This installation consists essentially of a cleared floodway approximately 600 feet wide defined by means of steel jetties on the river bends and straights-of-way where there is insufficient brush fringe.

The cost of the channel rectification accomplished to date is about $9 million or about 66 percent of the total channel rectification program.

I might say that that prototype channel, with those fairly inexpensive jacks and cable-type jetties, has worked extremely well, we think. I would like to have Mr. Thompson touch on that a little in detail.

Mr. THOMPSON. There is a 4-mile reach in this prototype where the district has had on all years of flow, where the river exceeded maybe a 5,000 second-feet, where they had a lot of trouble with the river cutting into the levee and threatening to break through the levee, with this installation in there it has moved the river out about 150 feet from the levee, scoured down about 2 feet in this 600-foot width, and deposited material in the overbank.

This past year, the season just past, there was a flow of about 11,000 second-feet through that reach, and we have not had any trouble. That is the kind of installation that we propose with the corps through this 100-mile reach, of which about 90 miles actually needs work.

Mr. DOMINY. Work yet to be completed on the irrigation system and rehabilitation and improvement—we have about 100 miles of laterals remaining to be rehabilitated and other minor improvements are being considered. Expenditure of about $3 million is scheduled for completion of the irrigation system rectification.

On the channel rectification program yet to be done, the Bureau's channel rectification work remaining is that proposed for the Truth or Consequences reach downstream from Elephant Butte Dam, and for the middle valley—Cochiti-Rio Puerco—area. The Truth or Consequences works are scheduled for construction in fiscal year 1959 at a cost of about $100,000 and involve a rectified channel to accommodate high frequency flows up to 6,500 cubic feet per second. This channel will cover a reach of river slightly less than 4 miles long and consists mainly of clearing and pilot cuts through high reaches.

An overall plan has been developed for the 100-mile middle valley area and integrated with the Corps of Engineers levee plan. The levee improvement and rehabilitation program of that agency is a key factor in accomplishment of the channel rectification program in the middle valley area.

The Bureau's schedule contemplates initiation of construction in the middle valley area in fiscal year 1959 to the extent of about $1,650,000. The scheduled fiscal year 1959 work contemplates concurrent corps' accomplishment to the extent of about $500,000. This is contingent upon appropriations therefor being made to that agency.

If the corps is not able to accomplish its part of the program it will be necessary for the Bureau to defer most of its scheduled middle valley area program. The estimated Bureau portion of the total program is about $4½ million and the total crops' portion would be about the same.

As I understand it, the appropriation bill that was enacted by the Senate yesterday, did not carry the requisite funds for the corps to do the corollary work in this area that we had expected them to perform. So we will not proceed with our work in that area with the $1,650,000 in fiscal year 1959 and we have told the Appropriations Committee that in the event the corps did not get corollary funds, that we would transfer this money that we have in our program to another reach of the river and do some channel work that can be performed independent of action by the corps.

The CHAIRMAN. The corps did not ask for any money for that purpose in this year's bill. But they were given $50,000 for further study. They indicated that they would like to study the matter further and they did get $50,000 for that purpose.

Mr. DOMINY. This delay in going ahead in the middle valley isn't too serious if we can get to that work within a year or two. Because we are going only to move to another stretch of the river and use the money that we have programed to good advantage.

The CHAIRMAN. The testimony that is being adduced this morning will help out in providing the future funds.

Mr. DOMINY. I am sure it will, Mr. Chairman.

Water conservation studies:

The authorizing legislation—Public Law 858—provides:

> The Bureau of Reclamation, in conjunction with other interested Federal agencies, is directed to make studies to determine feasible ways and means of reducing nonbeneficial consumption of water by native vegetation in the flood plain of the Rio Grande and its principal tributaries above Caballo Reservoir; and * * *

The water salvage measures incorporated in the middle Rio Grande project channel rectification and drainage programs have recognized this and other congressional directives. However, extensive additional opportunities for water salvage remain.

Development of plans for achieving such salvage will require detailed analysis by reaches and the costs of potential salvage works. The Bureau has under consideration an expanded investigation program for this purpose. A detailed presentation of this problem will be made at an appropriate time.

Additional flood protection works needed:

The authorizing reports of the Bureau of Reclamation and the Corps of Engineers both proposed the construction of the Chiflo Reservoir on the main stem to control the Rio Grande flows to within the design capacities of the levee system within the middle valley. Provision of this flood-control storage is recognized by the Bureau to remain essential to protect improvements which it has constructed under the middle Rio Grande project and has scheduled for undertaking later. The Bureau considers that provision of such additional upstream flood-control storage at the earliest practicable time would be in the Federal interest in light of the investments which have been made under the middle Rio Grande project.

The CHAIRMAN. In this instance you are referring to Chiflo?

Mr. DOMINY. I am referring to the fact that the original plan called for as much upstream control, at least as much as would have been provided had Chiflo Reservoir been constructed.

Now, as I understand from the testimony this morning, based on more recent studies, the corps indicates there is a more feasible plan, and Mr. Thompson has advised me that from his review of that in the field it looks like an excellent proposal. I have no doubt that the Bureau will find it fully in accord with our work in the area.

As previously stated, completion of the Bureau's program for channel rectification in the middle valley area is contingent upon the Corps of Engineers accomplishing its authorized levee improvement program in that reach. The Bureau urges that action to that end receive high priority.

The Bureau's authorizing report recognized the need for further studies and possible control of sediment inflow from the Rio Puerco and Rio Salado, two large silt contributors near Socorro. Some investigations have been made of the sediment problem as it affects the channelization works in the Socorro and San Marcial areas, but the studies should be enlarged to consider the need for control of sediment and floods from these two major tributaries.

The CHAIRMAN. You referred to other Government agencies. What cooperation have you had from the Soil Conservation Service and the Forest Service with reference to your general drainage area?

Mr. DOMINY. I would like to have Mr. Thompson comment briefly on that, Senator.

Mr. THOMPSON. To this extent: That they have made available to us their water supply studies and reports on proposed upstream flood-control projects. For example, that project at Bernalillo that was constructed. That is about the extent of it, Senator.

The CHAIRMAN. Has the Forest Service given you any help?

Mr. THOMPSON. To the same extent that they have done some experimental work in the northern part of the State.

Senator JORDAN. Is there any reforestation going on through there by the agency?

Mr. THOMPSON. I couldn't answer that, sir. One thing they have done out there that is of considerable interest to the State, and it may be out of order, Senator, they have some experimental plots where they have replaced a lot of sagebrush with crested wheatgrass. It is in the Forest land, but it is not necessarily a tree planting.

The CHAIRMAN. It is Government land?

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Mr. THOMPSON. Yes, sir.

Mr. DOMINY. I believe the bulk of the sediment problem on the Rio Puerco is on public domain land and privately owned rangeland as contrasted to Forest land. Isn't that true?

Mr. THOMPSON. Yes.

The CHAIRMAN. Senator, the Forest Service has a reforestation program in New Mexico, I am sorry to admit with only fair cooperation received from the State in that particular respect. The Forest Service is planting trees like they do corn. They have a little machine to put down trees. But it does take State legislation in order to get State cooperation, and New Mexico has not done that as yet.

Are there any questions of Mr. Dominy, Senator Church?

Senator CHURCH. No questions, Mr. Chairman.

The CHAIRMAN. Senator Jordan?

Senator JORDAN. No. I am sorry I was late in getting here and didn't hear the beginning of the statement. It is a very interesting study. I was tied up in another meeting. There always seems to be 2 or 3 at the same time.

The CHAIRMAN. Do you have any further studies on the Rio Puerco?

Mr. THOMPSON. No, sir; we have not made any further studies, but those that were made in the original report of the stream itself, of the sediment coming out of the stream and the effect that it has on our channel program as far as operation and maintenance is concerned.

The CHAIRMAN. Have you any authority under the original legislation to make such a study?

Mr. THOMPSON. I don't know for sure—I believe it might be considered to be included in that section that authorizes us to make studies of nonbeneficial use. It could be tied into that because of the sediment coming out of it. That is one of the tributaries.

The CHAIRMAN. As I recall the report made by the House, it provides for those studies, or suggested such studies, with the idea of doing something on the Rio Puerco. But nothing has been done as yet?

Mr. THOMPSON. No, sir.

Senator JORDAN. Is all this watershed in New Mexico?

The CHAIRMAN. Yes.

Mr. DOMINY. The part that we are discussing here is in New Mexico.

The CHAIRMAN. The channel is interstate. So Texas is interested, and Colorado is interested, and we have some people here from Texas.

Senator JORDAN. That is what I wondered about.

Mr. DOMINY. The Rio Grande heads in Colorado, goes across New Mexico, and goes across a piece of Texas, and then forms the boundary of Texas and Mexico for a long reach. We are considering here the middle area through New Mexico.

The CHAIRMAN. Mr. Miller, tell us first how many Indian pueblos there are along either the main channel or the tributaries of the Rio Grande and how they are concerned in the problem that we are now discussing.

Mr. MILLER. There are six Indian pueblos within the Middle Rio Grande Conservation District which are being benefited by the work. We have Cochiti at the north, Isleta at the south, Sandia, San Felipe, Santa Ana, and Santo Domingo.

The CHAIRMAN. Besides those, is not the Taos Pueblo affected?

Mr. MILLER. The Taos Pueblo; yes.

The CHAIRMAN. And Picuris.

Mr. MILLER. Picuris.

The CHAIRMAN. And San Ildefonso?

Mr. MILLER. Yes, and San Ildefonso will also obtain benefits.

The CHAIRMAN. San Ildefonso is within the middle Rio Grande project and is on the main channel of the Rio Grande?

Mr. MILLER. Yes, sir.

The CHAIRMAN. But Taos Pueblo is on a tributary of the Rio Grande. So they are affected by the program, too.

Mr. MILLER. Yes, sir.

Senator JORDAN. Are they Indian villages?

The CHAIRMAN. Indian villages.

What is the population, just an estimate, of the entire Indian villages affected by the middle Rio Grande project?

Mr. MILLER. I think it is about 6,000. There are about 4,000 within the 6 pueblos included in the conservancy district.

The CHAIRMAN. That is from the middle Rio Grande——

Mr. MILLER. In the middle Rio Grande; yes, sir.

The CHAIRMAN. Conservancy District. Without taking into consideration the other ones outside of the district that are affected by the Rio Grande as such?

Mr. MILLER. Yes, sir.

The CHAIRMAN. How has the program been progressing with reference to the Indians?

Mr. MILLER. Starting with 1957, the Indian Bureau had an appropriation of $180,000. In 1958 we had an appropriation of $200,000. That is for the land-development work within the six pueblos of the Middle Rio Grande Conservancy District.

We estimate that the total authorization under the bill for work under the Indian Bureau was $855,000. At Cochiti no construction work has been initiated. The Indian council desires a program; that is, a program of land development and reassignment of land but the individual assignees have not agreed to the reassignment program.

The CHAIRMAN. You were authorized a total of $854,730 originally for land leveling on Indian lands?

Mr. MILLER. And rehabilitation of the canals serving those lands, but not for rehabilitation of the district canals within the pueblos.

The CHAIRMAN. What progress have you made with that money?

Mr. MILLER. At Isleta, 14 miles of canal have been rehabilitated and 240 acres have been cleared, leveled, and partially planted. All of the Indians have not yet agreed to relinquish their assignments. But that I mean some of the Indians living outside the 240 acres have not agreed to relinquish their old assignments, so they have not been able to start out on a land-leveling program there.

The CHAIRMAN. Does that include all the pueblos or only——

Mr. MILLER. No. I am coming to Sandia. Five miles of canals have been rehabilitated and 420 acres in two separate tracts have been subjugated and 200 acres are in crop.

The CHAIRMAN. Pardon me. In order that you boys may be oriented, you will see where Albuquerque is. Isleta Pueblo, the one he is now discussing, is about 12 miles south of Albuquerque and Sandia is about 9 miles north.

Senator JORDAN. Are they trying to get some land in production?

The CHAIRMAN. They have land, but they can't use it fully because it is not leveled. Water can't reach many spots.

Mr. MILLER. They are also in very small tracts, some as low as 2½ acres. A lot of those people are now working in nearby villages in defense work, and their farm land is idle. One of the objects of the program is to reassign that land in an economic size farm unit.

To go on with Sandia: In addition a contract for subjugation of an additional 200 acres has been awarded, and fiscal year 1958 funds were obligated for the work. The work has not actually started yet.

The CHAIRMAN. You have done some leveling at Sandia?

Mr. MILLER. Yes, sir. We have 420 acres that have been completely cleared, leveled, and 260 of those acres are in crop.

Senator JORDAN. Is that land all irrigated where it is cropped?

Mr. MILLER. It is all irrigated from the works of the Middle Rio Grande Conservancy District.

Senator JORDAN. This Indian land?

Mr. MILLER. Yes, sir.

Senator JORDAN. That is the reason you have to level it, so you can irrigate it?

Mr. DOMINY. Yes, sir. In this area the rainfall is deficient for dry land agriculture. Any agriculture has to be under irrigation. In order to farm it properly it needs to have the necessary irrigation ditches, and fields have to be leveled, and there has to be provision for such drainage as is necessary to take away the excess waters.

The CHAIRMAN. I think, Senator, you would be interested in the origin of the Indian rights of the Pueblos. They go back to Philip II of Spain. Every Pueblo was granted a land grand in perpetuity, with the provision that they could not alienate a single acre. It went from the middle of the river to the top of the mountain. The areas adjacent to the river have always had irrigation, for subsistence.

Then on the uplands, or the mesas, was where they herded their cattle and their sheep.

Senator JORDAN. Also to do the hunting?

The CHAIRMAN. That is right—in the mountains. They have 3 leagues of land. That was the width of it, which would be about 9 miles wide. And in that valley lots of lands can be irrigated, but the poor Indians have not been able to do it up to now. That is why we insisted on leveling some of that land so that instead of irrigating an acre and a half or two they could have 30 or 40.

Mr. MILLER. At San Felipe no construction work has yet been originated. We have been working with the San Felipe Tribal Council to try to arrange a rearrangement of the land.

The CHAIRMAN. That is a narrow stretch?

Mr. MILLER. Yes, sir.

The CHAIRMAN. They don't stretch out as at Sandia? Isn't that a narrow tract near the river? The land is narrow and the land available is a narrow tract?

Mr. MILLER. Yes, sir; very narrow.

Senator JORDAN. Is that fertile? Do they have plenty of water?

Mr. MILLER. Extremely fertile. At Santa Ana, 100 acres have been cleared and surveyed. The Indians have agreed to reassignment of the lands, plans for which are now being prepared.

It is always necessary to prepare a complete map of the old assignments and then the new assignments so the Indians can agree to the new assignment before we can start on the work.

The CHAIRMAN. Under that plan what would be the increase in irrigable acreage—under the plan that you have in mind?

Mr. MILLER. I think it would increase somewhere from about an average of 5 acres to a family to about 40 or 60 acres to a family. That will mean that we will have to bring in a lot of the lands that have never been completely reclaimed, and some of the Indians who are working in neighboring towns and villages will have to give up their assignments.

The CHAIRMAN. You see, the older men cannot work more than an acre and a half or two, and the young men must find work in Albuquerque.

Mr. MILLER. I think that has a lot to do with it. At Santo Domingo no construction work has been initiated. Surveys have been completed on about 690 acres. The Indians at Santo Domingo have not yet agreed to a reassignment program. We are still working with them and we hope that they will finally agree to it.

The CHAIRMAN. They have quite a bit of land that could be made available.

Mr. MILLER. Yes, sir.

The CHAIRMAN. By reassignment?

Mr. MILLER. Yes.

Senator JORDAN. Is the proposal to give new land in exchange for what they have, which would be more suitable for them to make a living on?

Mr. MILLER. Yes. The land they have is almost a religion with them. Some of them, although they are only assignments and not allotments, have been in the family for generations. It is very difficult to convince them to give them up. We are making some progress—very good progress, as a matter of fact—on having them agree to the reassignment. But sometimes it moves an Indian perhaps a quarter of a mile or a half mile from his original landholding, and sometimes they look at that with pretty much concern.

The CHAIRMAN. The Indian Bureau is having the same trouble with the Indians that Mrs. Roosevelt had with rehabilitation in West Virginia.

Mr. MILLER. In all, 17 miles of canal have been rehabilitated, 660 acres have been completely subjugated—cleared and leveled and field ditches installed—and a contract is pending for an additional 200 acres. Nine hundred and sixty acres have been cleared, and surveys have been completed on about 3,500 acres.

I would like to say now, though, that the rehabilitation of the irrigation systems and subjugation of Pueblo Indian lands as provided under the 1948 and 1950 acts is proving of immense benefit to the Indians. It is now apparent, however, that the estimate of $855,000 made in 1947 for land development is inadequate. It appears that a substantially increased authorization will be necessary to complete the program.

The Pueblo Indian lands of the middle Rio Grande Valley will be greatly benefited by the enactment of this bill.

The CHAIRMAN. Is your Bureau going to recommend further authorization? I am pretty sure that the Congress would be receptive to a good recommendation for the Indian Bureau.

Mr. MILLER. From the Indian Bureau?

The CHAIRMAN. That is right.

Mr. MILLER. Yes, sir. We desire to put in such a recommendation.

Senator JORDAN. Mr. Chairman, I have another meeting that I am obliged to go to now. I am sorry that I have to leave but I will get the record and study it.

Mr. DOMINY. I have been familiar with the middle valley for the past 30 years, and this program is badly needed and it is doing a wonderful thing for the economy of that area.

The CHAIRMAN. The purpose of the meeting this morning was more to get a progress report and what else Congress could do in order to carry out the original plan.

The CHAIRMAN. Mr. Dominy, your original comprehensive statement will be put in the record at this point.

(The complete statement of Mr. Dominy follows:)

STATEMENT OF FLOYD E. DOMINY, ASSOCIATE COMMISSIONER, BUREAU OF RECLAMATION

COMPREHENSIVE PLAN

Concurrent investigations by the Bureau of Reclamation of the irrigation and drainage needs of the middle Rio Grande project and by the Corps of Engineers of the flood and sediment control problems of the Rio Grande Basin in New Mexico resulted in development of the comprehensive plans presented in House Document 653, 81st Congress, 2d session, and House Document 243, 81st Congress, 1st session, respectively.

Both plans were designed to stabilize and improve the economy of the Rio Grande Basin in New Mexico through control and use of the flows of the Rio Grande and its tributaries. They recognized the need for rehabilitation and improvement of the existing flood control, drainage, channel rectification, and irrigation works and for construction of additional improvements to control Rio Grande flows, provide for degradation of the Rio Grande channel through the middle valley and permit optimum use of the available Rio Grande flows.

Negotiations between the two agencies had resulted in an agreement between the Secretary of the Army and the Acting Secretary of the Interior on November 21, 1947, on the major works and the division of responsibilities to be proposed. Under this agreement, both documents proposed the construction of the following major features and that responsibility for construction, operation, and maintenance thereof be undertaken by the two agencies as indicated below:

Feature:	*Responsible agency*
Chamita Resorvoir	Corps of Engineers
Chiflo Reservoir	Corps of Engineers
Jemez Reservoir	Corps of Engineers
Levees for local flood protection	Corps of Engineers
Irrigation and project rehabilitation	Bureau of Reclamation
El Vado Reservoir rehabilitation	Bureau of Reclamation
Drainage rehabilitation and extension	Bureau of Reclamation
Channel rectification	Bureau of Reclamation

The proposals for levee improvement and channel rectification were based on studies by the Corps of Engineers. However, as the proposed channel rectification was deemed to be closely related to irrigation, it was considered that the Bureau of Reclamation should be responsible therefor.

The comprehensive plan for improvement and rectification of the Rio Grande Channel through the Espanola and middle Valleys contemplated that the proposed Chiflo, Chamita, and Jemez Reservoirs together with the existing reservoirs would control the flows of the Rio Grande within the design capacities of the proposed levee system and minimize sediment inflow to the middle valley.

It contemplated that regulated releases of comparatively clear water from the reservoirs would aid in degradation of the Rio Grande Channel downstream to the backwaters of Elephant Butte Reservoir.

The action of the reservoirs would be supplemented by channel rectification works from the head of the Espanola Valley to the backwaters of Elephant Butte Reservoir. A major phase of the channel rectification works was to be construction and maintenance of a dredged channel between the northern boundary of the Bosque del Apache and the Elephant Butte Reservoir. The plan also contemplated channel rectification in the vicinity of Truth or Consequences (formerly Hot Springs), N. Mex., to alleviate damage caused by occasional high discharges from Elephant Butte Reservoir plus tributary inflow below the reservoir.

The plan assumed that degradation in the middle valley would start after completion of the reservoirs, estimated to be 6 years after initiation of construction, and would not be fully accomplished for an indefinite period, estimated at a minimum of 16 years after initiation of construction and depending on the effectiveness of channel rectification measures.

The plan contemplated that the sequence of construction would be as follows:

First priority: Channel rectification by dredging of the lower section; initiation of interior drainage improvements; and construction of Chamita Dam.

Second priority: Initiation of rehabilitation of the irrigation works; and construction of Jemez Dam.

Third priority: Construction of Chiflo Dam.

Fourth priority: Other floodway improvements and channel rectification works.

AUTHORIZING LEGISLATION

The Flood Control Act of June 30, 1948, (Public Law 858, 80th Cong., 2d sess.) provided as follows:

"RIO GRANDE BASIN

"The comprehensive plan for the Rio Grande Basin as set forth in the report of the Chief of Engineers dated April 5, 1948, and in the report of the Bureau of Reclamation dated November 21, 1947, all in substantial accord with the agreement approved by the Secretary of the Army and the Acting Secretary of the Interior on November 21, 1947, is hereby approved except insofar as the recommendations in those reports are inconsistent with the provisions of this act and subject to the authorizations and limitations set forth herein.

"The approval granted above shall be subject to the following conditions and limitations:"

* * * * * * *

"(b) Chiflo Dam and Reservoir on Rio Grande shall be excluded from the middle Rio Grande project authorized herein without prejudice to subsequent consideration of Chiflo Dam and Reservoir by the Congress; * * *

"(c) The Bureau of Reclamation, in conjunction with other interested Federal agencies, is directed to make studies to determine feasible ways and means of reducing nonbeneficial consumption of water by native vegetation in the flood plain of the Rio Grande and its principal tributaries above Caballo Reservoir; and"

* * * * * * *

"There is hereby authorized to be appropriated the sum of $3,500,000 to be expended by the Department of the Army for the partial accomplishment of the comprehensive plan for the Rio Grande Basin."

The Flood Control Act of 1950 (Public Law, 516, 81st Cong., 2d sess.) provided as follows:

"RIO GRANDE BASIN

"In addition to previous authorizations, there is hereby authorized the completion of the plan approved in the Flood Control Act of June 30, 1948, for the Rio Grande Basin, at an estimated cost of $39 million for the work to be prosecuted by the Department of the Army and $30,179,000 for the work to be prosecuted by the Department of the Interior as set forth in House Document No. 243, 81st Congress."

On the basis of the above legislation, the Bureau of Reclamation was authorized to construct, operate, and maintain on a nonreimbursable basis the channel rectification works as proposed in House Document 653 and House Document

243. Authority was granted to the Corps of Engineers for construction of the related flood-control levees and the Chamita and Jemez Reservoirs, but construction of the main stem Chiflo Reservoir was not authorized.

A pertinent feature of the authorizing legislation was the directive to the Bureau of Reclamation to make studies of feasible means of reducing nonbeneficial consumption of water by native vegetation in the flood plain of the Rio Grande and its principal tributaries above Caballo Reservoir.

DEVELOPMENTS SUBSEQUENT TO FEASIBILITY INVESTIGATION AFFECTING AUTHORIZED PLAN

Following authorization of the middle Rio Grande project by the Flood Control Act of 1950, funds in the amount of $298,000 were made available to the Bureau of Reclamation for advance planning in fiscal year 1951. The project office was organized and staffed sufficiently so that field surveys and office studies were started about November 1950. The authorized plan contemplated construction of the dredged channel portion of the channel rectification and construction of the Chamita Dam as first priority actions with completion of the channel rectification to follow construction of the Jemez and Chiflo Dams. However, the continuance of a protracted drought, together with high water losses in the delta areas upstream from Elephant Butte Reservoir backwater, had placed the State of New Mexico in debt status under the Rio Grande compact and resulted in extreme water shortages on the downstream Rio Grande project. Accordingly, and in compliance with the directive of the authorizing legislation which directed that studies be made of plans for achieving water salvage, Bureau of Reclamation efforts were concentrated first on developing a plan for temporary works, which would immediately accomplish the maximum practicable water savings. This resulted in development of a plan for a channel and floodway in lieu of a dredged channel, through the delta area in which the greatest concentration of nonbeneficial consumptive uses of water was recognized to occur.

The Secretary of the Interior, in an effort to start construction as soon as possible, requested the Bureau of the Budget in March 1951 to release impounded funds for advance planning in fiscal year 1951 and to approve appropriation of funds to start construction in fiscal year 1952.

The President indorsed a program of emergency water salvage measures in a letter dated May 23, 1951, to the Secretary of the Interior; and the 82d Congress, 1st session, through its reports on the fiscal year 1952 Interior Department appropriation bill directed as follows:

"The emergency work on the middle Rio Grande project, New Mexico-Texas, should be undertaken immediately for the purposes outlined in the President's letter of May 23, 1951, to the Secretary of the Interior, and the funds for this purpose should be made available by the Secretary of the Interior from unobligated balances currently available to the Bureau of Reclamation in its appropriation accounts for 'Construction and rehabilitation.'"

On the basis of these approvals, the Bureau of Reclamation undertook in fiscal year 1952, and completed in fiscal year 1954, the emergency channelization through the Bosque del Apache. Concurrently with construction of this initial stage channel rectification, detailed planning for rehabilitation and improvement of the Middle Rio Grande Conservancy District's drainage and irrigation systems was undertaken. Also, in light of the deferral of authorization of Chiflo Dam, deferral of construction of Chamita Dam, and the recognized urgency and importance of achieving optimum economical water salvage, reappraisal of the authorized channel rectification program was initiated.

As the result of these actions, rehabilitation of the drainage system was undertaken in fiscal year 1954, rehabilitation of the irrigation system was initiated in fiscal year 1955, and a modified plan for channel rectification was developed.

The latter plan provides for optimum economical water salvage concurrently with achievement of the authorized purposes of channel degradation, flood protection, and minimization of floodway maintenance costs. This plan includes substitution of a permanent low-flow conveyance canal protected by a leveed and cleared floodway through the San Marcial reach in lieu of the previously contemplated dredged channel.

After consideration of the hazards of flood damage to channel rectification works, if constructed prior to completion of Chamita Dam and construction of upstream flood storage at Chiflo or alternative sites, it was concluded the urgency of achievement of benefits creditable to the adopted plan of channel

rectification merited immediate initiation of the channel rectification plan and accomplishment of that paln at a rate economically practicable from the construction standpoint.

The plan for channel rectification was reviewed in light of the Corps of Engineers plans for levee rehabilitation. It was determined that the Bureau of Reclamation's plan would fit in with the corps levee program.

On this basis, the modified channel rectification program was initiated in fiscal year 1956.

Following is a summary of the construction accomplished to date and contemplated.

WORK ACCOMPLISHED TO DATE

Drainage and irrigation system rehabilitation and improvement

About 400 miles of drains have been cleaned, cleared of brush, deepened and provided adequate access roads and bridges and culverts. The drainage system has been modified as appropirate to provide for optimum salvage of drainage flows for irrigation use. It is considered that the drainage construction is complete.

Rehabilitation of the irrigation system has included repairs and modification of the El Vado storage dam. This work consisted of a new trash-rack structure, cleaning and painting of the steel face, overhauling of gates and machinery and grouting of foundations. The four diversion dams of the project have been repaired and some of the structures modified to reduce the amount of sediment entering the canals. Approximately 100 miles of laterals have been rehabilitated. This work consisted of replacing wooden structures with new concrete structures, cleaning and enlarging and building access roads.

As part of the rehabilitation work, the district's bonds were acquired at a cost to the Government of $5,300,000.

The total cost of the drainage and irrigation system actions accomplished is about $15 million, including cost of bond acquisition.

Channel rectification

The channel rectification work completed or under contract at the end of fiscal year 1958 includes the following major items:

1. Eighty-two miles of channelization through the San Marcial, Socorro, and Bernardo areas. This work consists essentially of a low-flow channel of 2,000 cubic-feet-per-second capacity which will handle the river flows 85 percent of the time; a spoil bank levee on the east side of the channel protected by a brush fringe and/or steel jetty installations; and a cleared floodway ranging in capacity from 25,000 to 60,000 cubic feet per second to handle flood flows.

2. Through the Espanola area 20 miles of major channelization consisting of a cleared floodway 400 feet wide, pilot channels and river cutoffs to straighten the river and to minimize erosion of agricultural lands.

3. Twenty-one miles of minor water salvage channels in the San Antonio, Escondida, and La Joya areas which are designed to minimize overflow of large areas of native vegetation and to lower the water table through the areas.

4. Four miles of a prototype channel in the Belen area to test the effectiveness of the proposed installation for an approximate 100-mile reach of river in the Rio Puerco—Cochiti unit. This installation consists essentially of a cleared floodway approximately 600 feet wide defined by means of steel jetties on the river bends and straight-of-ways where there is insufficient brush fringe.

The cost of the channel rectification accomplished to date is about $9 million or about 66 percent of the total channel rectification program.

WORK YET TO BE COMPLETED

Irrigation system rehabilitation and improvement

About 100 miles of laterals remain to be rehabilitated, and other minor improvements are being considered. Expenditure of about $3 million is scheduled for completion of the irrigation system construction.

Channel rectification

The Bureau's channel rectification construction program is considered to be complete except for the works proposed for the Truth or Consequences reach downstream from Elephant Butte Dam, and the middle valley area. The Truth or Consequences works are scheduled for initiation and completion this fiscal year at a cost of about $100,000.

An overall plan has been developed for the 100-mile middle valley area and integrated with the Corps of Engineers levee plan which includes the corps completed Albuquerque levee system. The levee improvement and rehabilitation program of that agency is a key factor in accomplishment of the channel rectification program in the middle valley area.

The work determined to be the responsibility of both agencies is so closely intertwined that the awarding of separate contracts by both agencies for work in the same area is inadvisable and uneconomical. Therefore, the work of both agencies in each unit would be handled under a single construction contract administered by only one agency. Funds would be transferred by the agencies as required. The Bureau's schedule contemplates initiation of construction in the middle valley area in fiscal year 1959 to the extent of about $1,650,000. The scheduled fiscal year 1959 work contemplates concurrent Corps accomplishment to the extent of about $500,000. This is contingent upon appropriations therefor being made to that agency. If the Corps is not able to accomplish its part of the program it will be necessary for the Bureau to defer most of its scheduled middle valley area program. The estimated Bureau portion of the total program is about $4,500,000 and the total Corps portion would be about the same. The plan developed jointly by the Bureau of Reclamation and the Corps of Engineers provides for the Corps to install jetty fields at the outside of river bends and at points where the levees are exposed to direct attack by the river. The Bureau will install jetty fields as necessary on the inside of the river bends and on straight of ways between river bends to define the rectified river channel. The Bureau will also clear vegetation within a varying width channel and construct pilot cuts through high overbank areas along the alinement. This construction will deflect the Rio Grande flows from the levee system and ultimately induce about 2 feet of degradation in the rectified channel and about 2 feet of sediment to be deposited in the jetty fields and in the native vegetation that define the floodway. It will thereby minimize bank erosion and other flood damages, reduce channel and levee maintenance costs, and achieve salvage of water now lost to nonbeneficial consumptive uses.

The authorizing legislation provides, "The Bureau of Reclamation, in conjunction with other interested Federal agencies, is directed to make studies to determine feasible ways and means of reducing nonbeneficial consumption of water by native vegetation in the flood plain of the Rio Grande and its principal tributaries above Caballo Reservoir; and * * *". The water-salvage measures incorporated in the middle Rio Grande project channel rectification and drainage programs have recognized this and other congressional directives. However, it is considered that extensive additional opportunities for water salvage remain. Development of plans for achieving such salvage will require detailed analysis of the potentialities by reaches and the costs of potential salvage works. The Bureau has under consideration an expanded investigation program for this purpose. The contemplated program will include necessary supplemental stream gages, collection of ground-water data, vegetative density surveys and hydrologic analyses, together with related engineering and economic studies. A detailed presentation of this problem will be made at an appropriate time.

ADDITIONAL FLOOD-PROTECTION WORKS NEEDED

The authorizing reports of the Bureau of Reclamation and the Corps of Engineers printed as House Documents 653 and 243 both proposed the construction of the Chiflo Reservoir on the main stem to control the Rio Grande flows to within the design capacities of the levee system within the middle valley. Provision of this flood-control storage is recognized by the Bureau to remain essential to protect improvements which it has constructed under the middle Rio Grande project and has scheduled for undertaking. The Bureau considers that provision of such additional upstream flood-control storage at the earliest practicable time would be in the Federal interest in light of the investments which have been made under the middle Rio Grande project.

As previously stated, completion of the Bureau's program for channel rectification in the middle valley area is contingent upon the Corps of Engineers accomplishing its authorized levee-improvement program in that reach. The Bureau urges that actions to that end receive high priority.

The Bureau's authorizing report recognized the need for further studies and possible control of sediment inflow from the Rio Puerco and Rio Salado, two large silt contributors near Socorro. Some investigations have been made of the sediment problem as it affects the channelization works in the Socorro and

San Marcial areas, but the studies should be enlarged to consider the need for control of sediment and floods from these two major tributaries.

The CHAIRMAN. Our next witness is Mr. S. E. Reynolds. Mr. Reynolds is State engineer for the State of New Mexico.

You may proceed in your own way. We are very informal.

STATEMENT OF S. E. REYNOLDS, STATE ENGINEER AND SECRETARY, THE INTERSTATE STREAM COMMISSION, STATE OF NEW MEXICO

Mr. REYNOLDS. Thank you, sir.

My name is S. E. Reynolds. I am State engineer and secretary of the Interstate Stream Commission for the State of New Mexico. In these capacities I have responsibility for the administration and development of the water resources of the State of New Mexico.

Governor Mechem has directed me, Senator Chavez, to express his appreciation for your invitation to be here, and his regret that matters in New Mexico required him to leave this morning.

The CHAIRMAN. I understand, and I know of his interest in the matter.

Mr. REYNOLDS. In compliance with the provisions of section 4 of an act approved August 18, 1941—Public Law 228, 77th Congress, 1st session—the United States Army Corps of Engineers made a survey for flood control on the Rio Grande and tributaries in New Mexico. The plan for improvement as determined from this survey was coordinated with the Bureau of Reclamation's plan of development of the middle Rio Grande project and the reports were published in House Document 243, 81st Congress, 2d session.

An agreement between the Secretary of the Army and the Secretary of the Interior executed in 1947 provides for a unified plan of improvement of the middle Rio Grande Basin. Under this agreement the corps is responsible for the construction and rehabilitation of levees to provide necessary bank protection and a floodway channel, and the Bureau of Reclamation is responsible for channel rectification and the rehabilitation of existing drainage and irrigation facilities.

The Flood Control Act of 1948 approved most of the works recommended in House Documents 243 and 653 including the Rio Grande Floodway, the Bluewater Floodway, Jemez Canyon Dam, and Chamita Reservoir. The plans for the Chamita Reservoir, initially authorized for a capacity of about 700,000 acre-feet, were revised to achieve a considerable savings, and now include 2 reservoirs—Abiquiu Dam and Reservoir with an initial controlled storage capacity of about 560,000 acre-feet, and a low dam at Chamita creating a reservoir capacity of about 250,000 acre-feet.

Since the 1948 authorization, Jemez Canyon Dam for flood and sediment control has been completed and the Rio Grande Floodway is under construction with certain portions, including the very important Albuquerque reach, complete. Construction of Abiquiu Dam is underway with completion scheduled for 1962.

At least three additional flood-problem areas have been investigated by the corps since the 1948 authorization. One of these projects, to protect Albuquerque from runoff from the east mesa, was authorized

by the 1954 Flood Control Act. A similar plan to protect Socorro has been prepared by the corps and has been authorized by the Congress. A project for the protection of Las Cruces from arroyo flood flows is under investigation by the corps.

The CHAIRMAN. On East Albuquerque, or East Mesa, they call it the Sandia Conservancy District?

Mr. REYNOLDS. Yes, sir.

The CHAIRMAN. In the last appropriation bill we had $775,000 for construction.

Mr. REYNOLDS. I understand that is so, and we hope we can get underway with that soon because it is badly needed. Those people are in jeopardy, in the valley particularly.

The CHAIRMAN. In your capacity you operate and keep advised as to the progress either by the Reclamation Bureau or by the Army engineers on the work in the Middle Rio Grande?

Mr. REYNOLDS. Yes, sir.

The CHAIRMAN. As a matter of fact, all of the river?

Mr. REYNOLDS. Yes, sir.

The Bureau of Reclamation is making excellent progress in the accomplishment of the program of channel rectification and rehabilitation work approved by the 1948 Flood Control Act. This work is largely responsible for the fact that New Mexico has been able to reduce her water debt under the Rio Grande compact. The State, as you suggested, is cooperating with the Bureau of Reclamation, the Middle Rio Grange Conservancy District, and the Elephant Butte Irrigation District in drainage, channel rectification, and salt cedar eradication work, which is supplemental to the Bureau's authorized program. This cooperative work is also contributing to the improvement of New Mexico's deliveries under the compact. Total State funds contributed to such work in the current fiscal biennium amount to about $307,000.

I think it is clear from the résumé we heard this morning that the Corps and the Bureau of Reclamation are doing a commendable job on the Rio Grande and on behalf of New Mexico I wish to take this opportunity to express the State's appreciation.

A resolution adopted by this committee on June 28, 1956, directed the district engineer of the Albuquerque district to make a review survey for flood control on the Rio Grande and tributaries in New Mexico with the purpose of determining whether any modifications or additions to the plan as recommended in House Document 243 are necessary. New Mexico believes that that review survey is extremely well advised because of the very great increase in property values along the Rio Grande and its tributaries during the past decade, and because of the guidance that can be had from experience gained as a result of the operation of works already constructed.

I understand that a report on the review survey is now under preparation. There are a number of factors which the State believes should be given consideration in the review survey and the report thereon. Sedimentation is a major contributing factor to problems of flood damage, inadequate drainage, decreasing storage capacity of Elephant Butte Reservoir and increased costs of the operation and maintenance of irrigation works on the Rio Grande in New Mexico.

Therefore, to achieve the most economic solution of these problems, careful consideration must be given these measures and combinations of these measures:

1. Dams and reservoirs for flood and sediment control on the main stem of the Rio Grande.

2. Increase of main-stem channel capacity by (*a*) levee construction and channel rectification, and (*b*) scour by controlled releases from flood- and sediment-control reservoirs.

3. Dams and reservoirs near the mouth of tributaries for flood and sediment control.

Particular attention is invited to the Rio Chama, Galisteo Creek, Tonque Arroyo, Rio Puerco, and Rio Salado.

4. Upstream treatment of tributaries to reduce sediment production and discharge.

On this particular point, Senator, my office is cooperating with the Bureau of Land Management in soil-conservation work on the Rio Puerco. We are able to make only small progress on that very large problem. We still feel that there should be consideration given to sediment-control reservoirs, large sediment-control reservoirs on the Rio Puerco and Rio Salado.

In these studies appropriate consideration should be given the possibility that increased channel capacity may be desirable for the proper distribution of irrigation water. In this connection the plans should provide adequate outlet-works capacity in all flood- and sediment-control structures to insure that full utilization can be made of the channel capacity that can reasonably be expected to develop as a result of scour.

There are numerous local flood problems along the Rio Grande and its tributaries. The Corps is already aware of most of these and is giving attention to some of these. Among the major problem areas which are well known and for which the State has requested further consideration in the course of the review survey are the Belen, Grants, and Las Cruces areas.

In the event that flood protection by main-stem storage is provided only to the valley below Espanola it will be necessary to give particular attention to the construction of levees and to channel rectification in the Espanola Valley. Attention should also be given to protection of the Espanola area from flood flows of the Santa Cruz River.

The State has already been provided a brief summary of an interim report which the Corps is preparing on its studies of flood problems on the main stem of the Rio Grande. The State is hopeful that the Corps of Engineers will be provided adequate funds to complete expeditiously their interim report on the main-stem problems, and to extend their review survey to the entire Rio Grande Basin in New Mexico in order that the necessary works for flood control can be authorized and constructed as early as possible.

The CHAIRMAN. And they were allotted some money for further studies?

Mr. REYNOLDS. I understand that they were, and we are very appreciative of that. We hope that these necessary works can be authorized and constructed at an early date.

The Flood Control Act of 1948 authorized, among other works, the construction of levee protection and improvement and channel-rectifi-

cation works in the middle Rio Grande Valley in New Mexico. The authorizing legislation provides that work shall be constructed in a coordinated manner by the Corps of Engineers and the Bureau of Reclamation.

The proposed budget for fiscal 1959 provides $3,658,000 for work on the project by the Bureau of Reclamation. Of this amount about $500,000 is budgeted for levee and channel-improvement work below the Isleta diversion dam which must be accomplished in coordination with the Corps of Engineers. About $550,000 is required for that portion of the work which is the responsibility of the Corps. Since the 1959 budget didn't make provision for the Corps' part of the work, this work can't go ahead.

I am advised that the Corps of Engineers did not request funds for this work because it is the view of that agency that the authorized levee and channel-improvement work should be deferred until a review survey assessing the need for mainstem flood-control storage capacity has been completed, and such storage has been authorized. I also understand that this view was adopted by the Corps primarily because of their feeling that the levee-protective works would give the inhabitants who are in jeopardy a sense of security not justified without mainstem flood control.

The CHAIRMAN. The irony of that is that the Reclamation Bureau does not feel that way.

Mr. REYNOLDS. Neither do we. I am convinced that the facts just don't support the corps' position in that matter.

The CHAIRMAN. I can also say, in all sincerity and conscience, that the field department of the engineers does not feel that way, either.

Mr. REYNOLDS. There are 27 miles of levees that have been constructed in the Albuquerque reach of the river to protect the city against peak flows of up to 42,000 second-feet. I am sure that the testimony you are going to hear today will convince you that the people in the Albuquerque area, while they are deeply appreciative of the protection they have so far, have no false sense of security as a result of the construction of those levees.

The CHAIRMAN. Then that would apply to Belen, Socorro, and all of the villages between Belen and Socorro along the Rio Grande.

Mr. REYNOLDS. That is right. But here are the people of Albuquerque, while they do have good levees, they realize they are in great jeopardy from floods until storage has been provided on the main stem.

To insure that no false sense of security is developed, the State, the Middle Rio Grande Conservancy District, and the Middle Rio Grande Flood Control Association will all accept responsibility for keeping the citizens in the Middle Rio Grande Valley fully apprised of the degree of flood protection that would be provided by levee protective works constructed in advance of the completion of main-stem flood-control storage.

The levee protection and improvement works and channel rectification works which are already authorized are an essential part of any ultimate flood protection plan, including one which involves mainstem storage capacity; and the authorized work is urgently required at the earliest possible date, because the present seriously deteriorated condition of the levees and channel both above and below Albuquerque

endangers life and property in the Middle Rio Grande Valley in New Mexico. Valuable farmlands and vital highway and rail transportation facilities are in great jeopardy from frequent flows of moderate rate and duration.

There is a calculated risk that, if the levee and channel improvement works are constructed before main-stem storage is provided, the works may be damaged by sustained flows materially in excess of the 20,000 cubic-feet per second for which the works are designed. Such flows have occurred only once in the past 30 years, and this risk appears insignificant when compared to the present great danger from moderate flows occurring at frequent intervals.

The CHAIRMAN. The flow in the river this spring was possibly greater than it has been in years.

Mr. REYNOLDS. It was a good year, about 12,000 cubic feet per second.

The CHAIRMAN. And the levees took it?

Mr. REYNOLDS. Yes, sir. It took a great deal of work, and they had to be policed constantly.

Approximately 90 percent of the expenditure on the authorized levee and channel work which the corps is deferring will be for levee protective works, such as jetties. The only work to be done on the existing levees is rehabilitation at points of serious deterioration. If the plan ultimately developed by the corps and approved by the Congress requires the raising of levees to provide the necessary protection, all of the protective works now contemplated, representing 90 percent of the cost, would be essential to protect the raised levees.

Furthermore, the cost of the emergency levee protection work that will be required if the authorized levee and channel improvement works are not constructed may well exceed the cost of this authorized work.

In the spring and summer of 1957 there were 41 points at which the levees required constant policing with flows varying from 3,000 to 10,000 cubic feet per second. Emergency work totaling about $100,000 was required at 21 of these points. Similar difficulties were experienced during the spring runoff in 1958. These difficulties will be detailed by other witnesses appearing here today.

The effectiveness of the plan of improvement has been clearly demonstrated by a prototype section of the work installed in a 4-mile reach of the river below Belen in 1955, which Mr. Thompson described this morning. The channel in this reach has scoured in the predicted manner and it is now capable of passing up to 20,000 cubic feet per second safely and efficiently, whereas serious flood threats existed at several locations in this reach prior to the installation of the prototype.

I think it is clear that a number of years will have to pass before the current resurvey is completed and the mainstem flood-control storage capacity which may be authorized is planned and constructed. It is inconceivable that railroad, highway, agricultural, and urban property as well as life in the middle Rio Grande should remain exposed for such an extended period to the hazards posed by the present deteriorated and unprotected condition of the levees and channel.

This work has to be done at the earliest possible date. It is my understanding that funds have been provided for further studies. We sincerely hope this will lead to budgetary provisions for the work at the earliest possible time.

The CHAIRMAN. We were handicapped by the attitude of the Army engineers who did not request any money. The easiest thing we could have done, we could have gotten them the money if we had been given a little help. We keep on prodding them to get that report.

Mr. REYNOLDS. I know the people of New Mexico are greatly appreciative of your efforts in that matter.

The authorized work is urgently required to provide protection at the earliest possible date. The budget for fiscal 1959 should provide at least $550,000 for that portion of the levee and channel improvement program that is the responsibility of the Corps of Engineers in order that the work already planned by the Bureau of Reclamation for fiscal year 1959 can proceed.

An efficient channel of adequate capacity through the middle valley is essential, not only for flood control, but also for the preservation of irrigation water supplies for the Middle Rio Grande Conservancy District in New Mexico, and the Rio Grande project in New Mexico and Texas. Such a channel is also essential to insure the delivery of water by the States of New Mexico and Colorado in accordance with the Rio Grande compact and thus to preserve interstate comity. It is estimated that the levee improvement and protection works and channel rectification work will save from 10,000 to 20,000 acre-feet of water per year.

A resolution urging budgetary provisions for the levee and channel improvement work was adopted by the Rio Grande Compact Commission on February 21, 1958. With the committee's permission I will file a copy of that resolution with my statement.

The CHAIRMAN. I wish you would.

(The resolution follows:)

RESOLUTION ADOPTED BY THE RIO GRANDE COMPACT COMMISSION, FEBRUARY 21, 1958

Whereas the Flood Control Acts of 1948 and 1950 authorized the appropriation of funds for the middle Rio Grande project, which includes levee protection and improvement works and drainage and channel rectification works to be constructed in a coordinated manner by the Corps of Engineers and the Bureau of Reclamation for flood control and water salvage in the middle Rio Grande Valley in New Mexico; and

Whereas the present deteriorated condition of the levees and river channel poses, annually, a threat to life and property in the middle valley between the Pueblo of Cochiti and the town of Bernardo; and

Whereas an efficient channel of adequate capacity through the middle valley is essential for the preservation of irrigation water supplies for the Middle Rio Grande Conservancy District in New Mexico and the Rio Grande project in New Mexico and Texas; and

Whereas an efficient channel through the middle Rio Grande Valley is essential to insure the delivery of water by the States of New Mexico and Colorado in accordance with the Rio Grande compact and thus preserve interstate comity; and

Whereas the levee protection and improvement work, which is the responsibility of the Corps of Engineers in the coordinated program, must be accomplished concurrent with the drainage and channel rectification work, which is the responsibility of the Bureau of Reclamation in the coordinated program; and

Whereas the proposed budget for fiscal 1959 includes $1 million for that portion of the coordinated channel improvement program which is the responsibility of the Bureau of Reclamation, but includes no funds for that portion of the program which is the responsibility of the Corps of Engineers: Now, therefore, be it

Resolved, That the Rio Grande Compact Commission respectfully recommends that the Governors of the States of Colorado, Texas, and New Mexico address to the President of the United States and to the congressional delegates of their States an urgent request that the budget for fiscal 1959 include a minimum of $550,000 for levee protection and improvement work by the Corps of Engineers in the middle Rio Grande Valley in New Mexico.

Mr. REYNOLDS. In conclusion I wish to express the appreciation of the State of New Mexico for this opportunity to present the State's views on flood control on the Rio Grande and its tributaries, and to respectfully urge that this committee use its legislative and persuasive powers to expedite the completion of the review survey and report and to bring about the early construction of the authorized levee improvement and protective works and channel rectification in the middle Rio Grande Valley in New Mexico.

The CHAIRMAN. Mr. Reynolds, in your capacity as State engineer, your main problem is water; is that correct?

Mr. REYNOLDS. Yes, sir.

The CHAIRMAN. You have to worry about water all over the State?

Mr. REYNOLDS. That is right.

The CHAIRMAN. And we have very little water. So any efforts to increase the water supply for either domestic or industrial purposes should be encouraged?

Mr. REYNOLDS. That is right, sir.

The CHAIRMAN. You have been discussing flood protection which is necessary and very badly needed.

You referred to upper stream flood-protection dams?

Mr. REYNOLDS. Yes, sir.

The CHAIRMAN. The Army engineers have recommended—as you heard here this morning—the Cochiti and Galisteo Dams. There is a very large school of thought in New Mexico that you could get protection also from floods by the construction of the Chiflo Dam. I have been advised that if Chiflo were constructed it would be possible to save 100,000 acre-feet of water from evaporation that could be available to the main channel. Does that sound reasonable?

Mr. REYNOLDS. I am not in a good position to answer that question, Senator. I would certainly require hydrologic studies before I would be able to answer that question.

The CHAIRMAN. In considering the water problem you naturally have to consider the human factors and the economy of the State as a whole. Albuquerque is growing fast. As a matter of fact, all of the valley is growing in population, and industry is coming into the State. Could you give us some professional opinion as to what the building of Chiflo Dam would do with reference to the creation of power, hydroelectric power?

Mr. REYNOLDS. Obviously additional power in New Mexico is desirable. I think there can be no question that it would be engineeringly feasible to develop power at Chiflo. There are certainly reservations in my mind as to the economic feasibility of developing power at Chiflo, especially considering the terms of the Rio Grande compact and the structure of our State water law.

The CHAIRMAN. But if after proper studies the people interested in Elephant Butte Dam would be satisfied that instead of hurting it would firm the power that they now have, would you say that

Chiflo, which is the only area which we have now in the entire State of New Mexico to create further power, could be feasible?

I want to satisfy everybody, because they are all interested. I am just as much interested in taking care of the interests of the people below Elephant Butte Dam, because I have many a constituent, and even my friends in the El Paso area. I don't want to hurt them in any way, shape, or form. I would like to help in the long run. We need more power.

Mr. REYNOLDS. That is right, sir; no question about that. As State engineer of the State of New Mexico, and compact commissioner for the State of New Mexico, certainly we want any new development on the river to be operated to protect all existing water rights under our own State law, and to take full regard of our commitments under the Rio Grande compact.

I have had an opportunity to see only the corps' interim report on their study. I think that so far as I am concerned, at least, any decision as to the appropriate flood-control plan for the Middle Valley must wait until we have had the opportunity to review their full report.

I can say this much at the moment: That the plan recommended in their interim report appears to me to have much merits and benefits to recommend it. And it is worthy of careful consideration.

The CHAIRMAN. That is right. But if we can get back these flood-control benefits, plus electric power, it will be better.

Mr. REYNOLDS. Yes, sir; obviously we would like more power.

The CHAIRMAN. Thank you, Mr. Reynolds.

Mr. REYNOLDS. Thank you, sir.

The CHAIRMAN. We will call on Mr. Ball of the Middle Rio Grande Conservancy District.

STATEMENT OF HUBERT BALL, CHIEF ENGINEER, MIDDLE RIO GRANDE CONSERVANCY DISTRICT, ALBUQUERQUE, N. MEX.

Mr. BALL. Thank you, Mr. Chairman. I have a prepared statement which is quite long. If it pleases you I can brief it.

Mr. CHAIRMAN. We will insert it in the record and you can give us a brief summary.

(The statement referred to is as follows:)

STATEMENT OF HUBERT BALL, CHIEF ENGINEER, MIDDLE RIO GRANDE CONSERVANCY DISTRICT

Mr. Chairman and members of the committee, my name is Hubert Ball and I am chief engineer of the Middle Rio Grande Conservancy District. I have been connected with efforts to control floods that occur along the Rio Grande area within New Mexico for approximately 30 years. I have been employed by the Middle Rio Grande Conservancy District in various capacities for over 20 years, and since 1942 I have been chief engineer of the district in direct charge of flood control for that area over which the Middle Rio Grande Conservancy District has direct control. This is an area approximately 155 miles long averaging about 3 miles on each side of the Rio Grande and is about 200,000 acres in total area.

Within the flood control plain of the Rio Grande are situated 6 Indian Pueblos with 20,000 acres of highly productive farmlands and several villages and communities. I believe that a conservative estimate of the total number of Indians now living within the flood plain to be not less than 6,000. Most of these peoples' homes and livelihoods are dependent upon protection from floods that are pre-

vented by the various flood-control works heretofore constructed by various governmental agencies and the Middle Rio Grande Conservancy District.

Among the more important non-Indian municipalities, major portions of which are located within the flood plain, are city of Albuquerque, towns of Bernalillo, Los Lunas, Belen, and Socorro, all of which contain highly developed residential and industrial sections, as well as almost 100 percent of the public utilities upon which these inhabited areas depend for lights, power, domestic water supply, and heat. In addition to these urban areas there are many small agricultural villages and communities intermingled with about 95,000 acres of highly productive agricultural lands, a major portion of which is in cultivation and contains expensive irrigation works and improvements. The district also operates and maintains extensive and very costly irrigation and drainage systems located adjacent to the river whose value is estimated to be in excess of $30 million. These systems are most vulnerable to flood damage in the event of a major levee break. We believe that there is more than $500 million in property valuations that major floods could damage, in addition to the possibility of loss of life, additional damages resultant from major floods would be loss of time from jobs, the possible menace to community health, and general disruption of family life. In addition to the above local damages, the valley is traversed both north and south, east and west, by the Santa Fe Railroad which carries approximately 25 percent of all defense materials, supplies, and manpower depending on railroads for transcontinental transportation, plus numerous highways and roads. I point most particularly to Highways 85 and 66, which are a part of the new Interstate System and are most important to the national welfare. Damage to or destruction of these transportation units in time of a national emergency might bring about most disastrous results and create difficult critical conditions within the entire defense structure.

I hope that this brief description of affected areas gives you some idea of the magnitude the flood-control problem creates within the jurisdiction of the Middle Rio Grande Conservancy District and for which we are legally responsible and is our greatest concern.

The Middle Rio Grande Conservancy District believes that this flood-and-sediment-control problem may be properly divided into four sections.

The first would be completion of work previously authorized along the main stream and on major tributaries above Elephant Butte in New Mexico.

Second, continued planning and authorization of additional projects for minor tributary flood control, similar to the Sandia project now under construction near Albuquerque and to those which are being considered at this time in the vicinity of Socorro and Belen.

Third, authorization of additional main stream and tributary flood and sediment control with construction of dams and related structures that would be necessary to give a reasonable degree of protection from the designed project flood as determined by the Corps of United States Engineers to be economically feasible, plus the relief from the sediment problem which can be justified in this construction of dams on main streams in coordination with an accelerated soil and moisture conservation program on the related watersheds.

Fourth, sediment control which is also a unit of the major flood-control structures must also be gone into most thoroughly and extensively. I also will go into this problem in considerable detail later.

I now wish to go into these problems as listed and present the following information we believe to be pertinent to this hearing in the order as listed above.

The first problem is definitely an emergency and I wish to particularly stress the following list and detail of expenditures and problems we have just experienced during a comparatively minor flood from snowmelt on tributaries during April, May, and June 1958.

During the 1958 spring flood, as in every previous year, it was necessary for the Middle Rio Grande Conservancy District and other local interests to expend large amounts of money to make emergency repairs to prevent levee failures at numerous points. In many reaches, it was also necessary to increase the height of the levees to prevent overtopping.

The levee improvements and channel rectification authorized for construction in the river reach from Cochiti to the mouth of the Rio Puerco would greatly reduce the annual expenditures necessary to control the spring floods. Although the river flows this year were such as can be expected to occur about once every 2 years, a large expenditure was required to confine the flows to the floodway.

During the period from January 1, 1958, to June 30, 1958, local interests have expended the amounts shown in the following table on such emergency work:

Source of funds

	Total
Direct expenditures by the Middle Rio Grande Conservancy District	$3,211.00
Funds advanced to the United States by the district for operation and maintenance	41,986.00
Funds advanced by the State of New Mexico	18,703.00
Materials contributed to district by the Santa Fe Railroad	6,227.00
Total	70,127.00

In addition to the above funds the chief engineer of the conservancy district spent a considerable amount of time in coordinating flood-control activities. The time thus expended is valued at $850.

In addition to the above work which was financed by local interests, the Corps of Engineers maintained levee patrols throughout the spring flood. This work together with an emergency contract to reinforce levees damaged by river flows, involved the expenditure of about $70,000. Also, the Bureau of Reclamation allocated $27,408 from the soil and moisture conservation program to stabilize the riverbank at a point where a main canal was threatened. The total expenditure by both local interests and Government agencies during the 1958 flood was $168,385. In previous years, when larger flows occurred, the amounts expended on emergency flood control greatly exceeded this figure.

The Middle Rio Grande Conservancy District, of course, accepts maintenance of the district's levees as their obligation, however, the Middle Rio Grande Floodway which was authorized for joint construction by the Bureau of Reclamation and the Corps of Engineers provides for levee and channel improvements which would greatly reduce the required expenditure for flood control by the conservancy district.

The levee improvements authorized for construction by the Corps of Engineers include both installing jetty fields consisting of steel jacks to protect the levees at points where they are subjected to direct attack by the river and increasing the height of the levees to provide adequate freeboard in numerous reaches.

We are informed that the Corps of Engineers plans to defer this construction until they have completed a dam on the main stem of the Rio Grande, because of concern that they would create a false sense of security in the minds of the local people.

The Middle Rio Grande Conservancy District and other local interests agree that it is essential that a main-stem dam be constructed to provide flood protection for the Middle Valley. However, such a dam cannot become a reality for at least 10 to 15 years and some interim protection such as that authorized for the Middle Rio Grande floodway is essential. Although the conservancy district does not agree that the local people will feel a false sense of security, they are willing to raise the levees at their own expense in the Cochiti-Puerco reach if the Corps of Engineers will proceed at once with the installation of the levee protection works. These works are expected to be about the same for the existing levee system as would be required for the larger levees.

The authorized plan also provides for the Bureau of Reclamation to establish a rectified river channel which would train river flows along a defined floodway about midway between the existing levee system. This rectified channel is expected to induce degradation in the cleared floodway and sediment deposition in jetty fields and native vegetation that will define the rectified channel. The Bureau of Reclamation has requested funds to start this construction in fiscal year 1959. However, a concurrent appropriation for the Corps of Engineers is essential since the levee protective works authorized for construction by that agency are an essential part of the rectified channel proposed for construction by the Bureau of Reclamation.

Plans for the levee protection and channel rectification work are well advanced. A prototype installation about 4 miles long was installed in the Belen division in 1956. This test reach has performed as expected and a well-defined river channel has developed. As a result of this installation, it was not necessary to expend emergency funds in this reach during either the 1957 or 1958 spring floods. This has effectively demonstrated the value of the proposed work.

Most of the emergency work during floods is made necessary through erosion of the levees and sloughing of the riverside drain banks induced by seepage,

induced by the levees. Since the channel rectification and levee protection works establish the river channel near the center of the existing floodway, erosion of the levee is prevented and the drain bank sloughing is almost completely eliminated.

During the 1958 spring flood, the maximum flow was about 12,000 second-feet. Such a flow can be expected to occur about once in 2 years. Flows of about 20,000 second-feet can be expected to occur about once in 5 years. We were fortunate in 1958 in that our emergency flood fights prevented levee breaks; however, if the river flow had increased to 20,000 second-feet, as must be expected once every 5 years, it is probable that several disastrous levee breaks would have occurred.

The proposed levee improvements and channel rectification are designed to accommodate floods up to 20,000 second-feet. Since this work has already been authorized, it should be completed as soon as possible to provide this much-needed flood protection and reduce the unnecessary expenditures for emergency flood protective works along the levees.

The photographs which I shall leave with the committee illustrate the type of levee protective works that were installed on an emergency basis during the spring flood. The aerial photographs show the direction of the river flow which caused the levee trouble. Completion of the authorized work would largely preclude the necessity for such work in the future.

The corps plan for development, which was a part of a multiple-purpose project, legally described as "The comprehensive plan for the development of the middle Rio Grande area in New Mexico," authorized in 1948 and 1950. This authorization directed the construction of flood- and sediment-control dams on the Chama River and the Rio Jemez (major tributaries of the Rio Grande) in addition to construction of improvements to the flood-control works within the middle valley that would be coordinated with the channelization of the river to be carried out by the Bureau of Reclamation. Testimony of many witnesses, the reports and investigations of many governmental agencies also indicated the extreme importance and desirability of main-stream control. However, due to administrative and interstate problems, a proposed dam at the Chiflo site on the Rio Grande, which is near the New Mexico-Colorado boundary was deleted without prejudice. The dam on the Rio Jemez and the Albuquerque unit of the Rio Grande Floodway have both been completed and the corps is now constructing a dam on the Rio Chama near Abiquiu, N. Mex.

The unfinished portion of the comprehensive plan to be constructed by the corps consists mainly of additional floodway units located between Cochiti Indian pueblo and San Antonio, N. Mex. These consist of bank protection works along intermittent stretches of the river levees where there is grave danger from intermediate type flows that are experienced at about 5-year frequencies creating considerable danger to the levees and adjacent inhabited areas and agricultural lands. We have engaged in long and tedious negotiations with the Corps of Engineers hoping they can be persuaded to so coordinate their plan for the construction of these units in such order as required to properly cooperate with the Bureau of Reclamation in providing the works that were contemplated as part of the channelization and levee protection in the original authorization.

The second problem concerns floods which originate on comparatively small watersheds; but, due to location and geographic features, contribute floods of comparatively small volume but extremely high peaks which are a constant menace to various inhabited localities, agricultural lands, and conservancy district improvements.

The district's irrigation and drainage works, particularly, continue to suffer damage from these heavy arroyo floods. This situation is particularly severe in several residential areas of Albuquerque and Socorro where local flood control projects have been authorized or have been investigated and are now being considered by the Congress. Elsewhere in the valley, for example in Belen, similar planning and construction is most certainly of extreme urgency and the district feels that, while under the Conservancy Act they cannot assume direct responsibility for these problems, they are morally and legally justified in extending help to the limits of their ability in order that these projects may be planned, authorized and carried to successful completion.

The district directors, in a recent meeting, unanimously directed that this statement should emphasize the Belen situation with the express desire for the earliest possible action on the part of the corps. This is the largest remaining community not yet considered in the flash-flood-control program and the large

population of the area, plus possible property damages certainly indicates fast action is imperative. We believe other witnesses will present testimony and information to further justify this request.

This brings us to the third category; which is, that of flood and sediment control, and related existing problems along the Rio Grande from the Cochiti area on the north to Elephant Butte Reservoir on the south. We also include in the comprehensive plan the Espanola and San Juan area near the confluence of the Rio Chama and Rio Grande in Rio Arriba and Santa Fe Counties.

The district assumed the construction, operation, and maintenance of flood-control structures between White Rock Canyon and the Bosque del Apache in accord with its official plan, formulated under provision of chapter 45, 1927 session laws of the State of New Mexico. Aid and assistance of various Government agencies and local political subdivisions, most particularly the help of the Corps of Army Engineers, has enabled the district to carry on the program for the past 30 years. The district and the corps have consistently carried on this program to the best of their physical and financial ability. During that period numerous floods have been experienced along the river and we have made every possible effort to protect the area from possible loss of life and property. Many times we have been successful; however, we have also lost the fight on several occasions and severe damages in loss of property and life have been experienced. More successful efforts might have been possible; however, the structures we had to work with and the financial resources were not sufficiently ample to provide these additional efforts which we feel are beyond the capacity of local interests.

We further submit that although those various units now under construction will provide immeasurable benefits, the maximum justifiable flood control possible cannot be provided until some method is devised to control flows originating along the main stream and major tributaries on which investigations and reports are now being completed.

In addition to these problems presented by those not yet reported tributaries, certain units of the original comprehensive plan were deleted, as heretofore mentioned; and we believe this was brought about due to lack of necessary information which is now available to all interested parties in this project so that they, at this time, can decide on the feasibility of various structures which are now being considered. We trust that the added years of experience and information now available on the Rio Grande has convinced all concerned that the additional investigations directed by the public works resolution will produce the evidence necessary to convince any possible reasonable objection that these additional proposed structures are not only desirable but indeed mandatory. We further believe that a detailed and conscientious evaluation of now available material will convince any previously opposing interest that additional flood and sediment control units are really necessary for the future success of all areas along the Rio Grande both above and below Elephant Butte Reservoir.

The bill now being considered would authorize controls to be built along the main stream and on certain major tributaries of which the most serious flood and sediment contributor north of Albuquerque is the Galisteo River, described in detail by the Corps of Engineers' Reports in connection with this hearing.

The Middle Rio Grande Conservancy District does not make a recommendation or request for any predetermined reservoir locations and control of flows at this particular time, however, we surely would be in favor of reservoirs located to provide the most benefits for the least possible cost, or at least in an area where the cost-benefit ratio would be sufficiently favorable to influence the Congress to take early action toward authorization of this project.

We also desire that the highest possible maximum controlled flow which would not be detrimental to local areas, but, at the same time, provide the greatest possible benefits under the Rio Grande compact operations, be maintained through the middle valley area. This definitely means benefits to all water users in areas that would be affected by this bill.

We realize the cost required to increase controlled maximum flows and that the effects on water salvage require study and investigations, however, we think this is of sufficient importance that the increased cost necessary for a program of this kind can be justified. We know that flood control is primarily the responsibility of the corps, but the extent to which these flows will be controlled in the completed plan most definitely will effect the rectified channel throughout the lower end of the conservancy district and will certainly control, to some extent, the operation of all Middle Rio Grande Conservancy District works in

such a manner that the effect of any of these measures should certainly be evaluated to the highest possible degree by all concerned interests.

This brings us to the fourth most important problem which is a result of the terrific silt load carried by the Rio Grande waters annually.

The principal points in the control of silt I wish to stress in connection with this bill, S. 2975, is the urgent need for continuing construction on any of the Middle Rio Grande project features heretofore authorized, plus all reasonable haste in the consideration, authorization, and construction of units that are made possible by this proposed legislation, particularly those that help in the control of sediment in the middle valley.

Previous testimony has brought out the changes that have been made in the original flood- and sediment-control phase of the comprehensive plan. The main-stem control reservoir, Chiflo, was deferred without prejudice at the time the authorized legislation was passed, and Chamita Reservoir originally planned at the mouth of the Rio Chama has has been moved to the Abiquiu site some 20 miles upstream. Jemez Reservoir, completed in 1953, is the only flood- and sediment-control feature operating, and it provides only a small fraction of the complete protection originally planned.

As a result, the sediment load throughout the Cochiti division is undiminshed, and while it is diminished somewhat in the Albuquerque division, below the entrance of Jemez River, the load is still far too great to transport through the valley within the present channel. Moreover, Abiquiu Reservoir, when completed, will control much less sediment that would have been controlled by a reservoir at the Chamita site, which will be true until some future date when the proposed low dam at the Chamita will have been initiated and completed.

As an indication of the magnitude of this problem, the average annual amounts of sediment that must be controlled are approximately 3½ million tons from the Rio Chama, 1¾ million tons from the main stem of the Rio Grande, 1¼ million tons from the Rio Galisteo, and an estimated unmeasured load of 3¾ million tons entering the river at other points between Otowi and Bernardo.

A great many problems result from this sediment load. It is diverted to irrigation ditches, causing increased cleaning costs, and it is deposited in the floodway, choking the river channel, aggrading the floodway, and decreasing the efficiency of the present drainage system. Sediment from tributary arroyos and streams deposits in irrigation ditches, spreads over fields, and pours out into the river channel forming plugs that deflect the river flows. Below San Acacia diversion dam, in the Socorro division, the floodway surface was raised slightly over 1 foot by sediment deposition during the 1957 flood season. Several areas downstream received deposition amounting to from 3 to 5 feet, and at one point near the south end of the Socorro division the deposition amounted to approximately 8 feet. As a result of this deposition costly emergency flood control measures were required, and later the levees had to be raised and strengthened.

The great danger caused by sediment occurs during the receding stage of river flows. The behavior of the Rio Grande is unique in that as the flows increase, the channel widens and deepens, scouring out the bed material and creating a channel within the floodway capable of carrying the larger flows. As the high flows subside the sediments are again deposited filling the channel to approximately the same elevation as before. When the velocity subsides to the critical point the dropping sediment forms a bar which deflects the current and causes scouring in a different place. At this stage, the river is completely unpredictable and, if the current is deflected toward the levee, is extremely dangerous. The powerful current sweeps everything in its path. Huge trees are undermined in a matter of minutes, and if the current reaches the levee, the unconsolidated material from which it is made offers little resistance. The critical stage throughout most of the middle valley is when the flows drop to around 5,000 cubic feet per second.

COMPLETE PLAN OF CONTROL

The only complete solution to this problem is a plan providing control at least equivalent to that provided in the original comprehensive plan and in conformance with S. 2975. On the basis of detailed studies now completed, sediment retention reservoirs are essential on the main stem of the Rio Grande, on the Rio Galisteo near its mouth, and it may eventually be determined that a dam is economically feasible on the Rio Puerco. These are in addition to the Jemez Reservoir, already completed, and the Abiquiu Reservoir, now under construction. These controls, together with the rebuilding and strengthening of the levees and the defining and control of the channel with jetty fields will

provide the flood and sediment control contemplated in the original plan and will permit the unretained sediment to be transported downstream. Under the design contemplated, the channel would degrade to about the 1936 level.

SUMMARY

The average annual sediment load reaching the Rio Grande can be controlled by early completion of the planned floodway, authorization and construction of reservoirs on the Rio Grande, the Rio Galisteo near its mouth, and possibly on the Rio Puerco at some future date. With these features in operation, together with the Jemez and Abiquiu Reservoirs, the river channel could be maintained in its designed alinement and would degrade to 1936 conditions. The sediment control originally contemplated by the comprehensive plan for the middle Rio Grande project would be accomplished by these features. Ultimate construction of these features is essential.

In conclusion, I present a list of expenditures by local interests, plus estimated cost to Federal agencies due to emergency expenses and flood damage repairs made principally by the Corps of Engineers.

APPENDIX

Estimated flood damages of Middle Rio Grande Conservancy District

1935—Middle Rio Grande Conservancy District	$12,417.67
Others	24,000.00
Total	36,417.67
1935 damages estimated	0
1936—Middle Rio Grande Conservancy District	7,453.27
Others	14,000.00
Total	21,453.27
1936 damages estimated	0
1937—Middle Rio Grande Conservancy District	31,565.36
Others	50,000.00
Total	81,565.36
1937 damages estimated	50,000.00
1938—Middle Rio Grande Conservancy District	23,646.16
Others	40,000.00
Total	63,464.16
1938 damages estimated	0
1939—Middle Rio Grande Conservancy District	21,368.77
Others	60,000.00
Total	81,368.77
1939 damages estimated	0
1940—Middle Rio Grande Conservancy District	12,864.75
Others	100,000.00
Total	112,864.75
1940 damages estimated	0
1941—Middle Rio Grande Conservancy District	149,235.25
Others (no Army engineers cost included)	350,000.00
Total	499,235.25
1941 damages estimated	1,750,000.00

Estimated flood damages of Middle Rio Grande Conservancy District—Continued

1942—Middle Rio Grande Conservancy District	$132,231.44
Others (no Army engineers cost included)	300,000.00
Total	432,231.44
1942 damages estimated	1,000,000.00
1943—Middle Rio Grande Conservancy District	23,028.58
Others (no Army engineers cost included)	0
Total	23,028.58
1943 damages estimated	0
1944—Middle Rio Grande Conservancy District	11,196.60
Others (no Army engineers cost included)	0
Total	11,196.60
1944 damages estimated	150,000.00
1945—Middle Rio Grande Conservancy District	20,574.01
Others (no Army engineers cost included)	0
Total	20,574.01
1945 damages estimated	200,000.00
1946—Middle Rio Grande Conservancy District	33,815.86
Others (no Army engineers cost included)	0
Total	33,815.86
1946 damages estimated	0
1947—Middle Rio Grande Conservancy District	14,811.07
Others (no Army engineers cost included)	0
Total	14,811.07
1947 damages estimated	0
1948—Middle Rio Grande Conservancy District	68,646.22
Others (no Army engineers cost included)	5,000.00
Total	73,646.22
1948 damages estimated	150,000.00
1949—Middle Rio Grande Conservancy District	37,061.34
Others (no Army engineers cost included)	0
Total	37,061.34
1949 damages estimated	0
1950—Middle Rio Grande Conservancy District	7,477.46
Others (no Army engineers cost included)	0
Total	7,477.46
1950 damages estimated	0
1951—Middle Rio Grande Conservancy District	10,052.65
Others (no Army engineers cost included)	0
1951—Middle Rio Grande Conservancy District	10,052.65
1951 damages estimated	0

Estimated flood damages of Middle Rio Grande Conservancy District—Continued

1952—Middle Rio Grande Conservancy District	$67,740.00
Others (no Army engineers cost included)	50,000.00
Total	117,740.00
1952 damages estimated	200,000.00
1953—Middle Rio Grande Conservancy District	29,078.64
Others (no Army engineers cost included)	0
Total	29,078.64
1953 damages estimated	0
1954	0
1955—Middle Rio Grande Conservancy District	55,000.00
Others (no Army engineers cost included)	300,000.00
Total	355,000.00
1955 damages estimated	350,000.00
1956—Middle Rio Grande Conservancy District	20,000.00
Others (no Army engineers cost included)	20,000.00
Total	40,000.00
1956 damages estimated	15,000.00
1957—Middle Rio Grande Conservancy District	105,000.00
Others (no Army engineers cost included)	10,000.00
Total	115,000.00
1957 damages estimated	25,000.00
1958—Middle Rio Grande Conservancy District	46,000.00
Others (no Army engineers cost included)	125,000.00
Total	171,000.00
1958 damages estimated	200,000.00
Total all years:	
Middle Rio Grande Conservancy District	940,084.10
Others	1,448,000.00
Total exclusive of Corps of Engineers	2,388,084.10
Total direct damages all years	4,290,000.00
Grand total	6,678,084.10

The estimated cost to the Corps of Engineers since 1937 is not less than $3 million which has been spent on stopgap measures. This added to expenses of local interests amounts to $9,678,084.10 in cash outlay and does not start to show all the indirect losses due to loss of crops and similar damages suffered by private owners.

Mr. BALL. I have some photographs along with very complete reports on expenses of the conservancy district in connection with the flood this past year, which goes with the detail that I would like to have you put in the files of the committee.

The CHAIRMAN. We will put it in the files of the committee.

(The documents referred to above were made a part of the committee's files.)

Mr. BALL. Mr. Chairman, my name is Hubert Ball, and I am chief engineer of the Middle Rio Grande Conservancy District. I have been connected with the flood-control efforts in the Middle Valley

since 1932, for the past 20 years directly in charge of the operations of the district and their flood-control work.

We believe that the problems connected with the flow of the water in the river can be divided into four parts. The first one, of course, would be the completion of the presently authorized project. The completion of the units authorized in the 1948 act have been described to the committee by General Person and by Mr. Dominy. But they have not yet completed the bank protection works and a major portion of the floodway between Cochiti and Rio Puerco, and that has disappointed the local people and the district very much.

We have made a great effort in attempting to convince the corps that it would not instill a false sense of security which they seem to be so greatly scared of among the local people down there.

The CHAIRMAN. It was intended by the original act that the work would progress together?

Mr. BALL. Yes, sir.

The CHAIRMAN. As a duel effort?

Mr. BALL. Yes, sir.

The CHAIRMAN. The Army engineers were to do something, and the Bureau of Reclamation was to do something?

Mr. BALL. Yes, sir, and in the same area at the same time, and coordinate their efforts. Plans have been worked out to the point where they could let contracts immediately, and the Bureau of Reclamation has prepared and the appropriations are contemplated by the Congress.

The Corps of Engineers have consistently declined to request funds from the Congress to proceed with their portion of the work.

The second part that we think is very essential is the control of the arroyo problem. Congress has previously authorized and has made appropriations for the Sandia Conservancy District area near Albuquerque, and I believe that the President recently signed the omnibus flood-control bill which included work in the Socorro area.

The CHAIRMAN. That is right. And a survey at Las Cruces.

Mr. BALL. Yes, sir. We would also like to see surveys made at some future time, and preferably in the near future, north of Socorro in the Lemitar and the Belen and Los Lunas areas. The people at Belen are becoming very flood conscious and as the town grows it develops problems in connection with the arroyos.

Then the third and fourth would be direct flood control and sediment control, which, while they would ordinarily be directly connected, I have separated them because they both have their individual problems to the district.

The flood control would be control principally by construction of dams on the main stream and larger tributaries of the river.

I certainly believe that the people in the Espanola area, the San Juan area, and upper tributaries, are entitled to protection.

The CHAIRMAN. Espanola several years ago received $400,000 to make some kind of a rectification work.

Mr. BALL. Rectification of the channel. It did not go to the extent of providing the flood protection which I think they would be justified in receiving, Senator.

The CHAIRMAN. I agree with you.

Mr. BALL. So that in any program which is recommended to the Congress, I personally would insist that those upper areas receive protection.

As to the construction of dams and the method that they use for control, that is something that the Corps of Engineers and the Bureau of Reclamation certainly would be qualified to most ably point out and determine in their reports.

The CHAIRMAN. What do you think of Chiflo as a flood-control dam?

Mr. BALL. I would say that Chiflo certainly would provide considerable flood control to the Espanola area and to the downstream areas. And in connection with Galisteo I would think about it a long time before I would pass it up for other sites. However, as I said, the Corps of Engineers, after they make their investigations and studies, certainly they must be competent to determine the most feasible site.

The CHAIRMAN. We want to respect the judgment of the Corps of Engineers but we don't want to sneeze every time they take snuff, not in Congress.

Mr. BALL. I found that out in trying to get them to complete the bank protection work which we need in the Cochiti-Rio Puerco area, Senator. In addition, Chiflo certainly would provide a considerable saving in water because of the reduction in evaporation losses.

The CHAIRMAN. If anyone should know how short we are with water, you should.

Mr. BALL. Senator, I have had a lot of telephone calls in my life from people whose ditches are dry.

The CHAIRMAN. And Chiflo would provide additional water.

Mr. BALL. As a water-salvage project it would contribute considerably to a sustained flow in the river. I also would like to agree with Mr. Reynolds that I think certainly you would want to make a study of the hydrologic angles to determine the seepage losses in the channel in transporting it to Elephant Butte.

But there is no question that the evaporation losses at Chiflo Reservoir would be much less than at Elephant Butte. Of course there is always the consideration of power at Chiflo. As to the economy and the price at which power could be developed, that would be something that you would only know after a study had been made. However, in some of those areas it might be justified to construct a powerplant. The cost of power might be higher than at Glen Canyon or other types of power.

The CHAIRMAN. They have a booster station at Algodones, a steam plant. And that firms the power that comes north from Elephant Butte to Albuquerque. So if we did have power at Chiflo, it would further firm the power from Elephant Butte.

Mr. BALL. Yes, sir.

Concluding that portion, I would like to say that I certainly would not hesitate to take the recommendation of the corps, the Bureau, and the decision of this committee as to the location of the dams, the sizes, and the second-feet to which they would propose to control the flow of the river in the future. I would think that a controlled flow of the river which would be consistent with channel conditions below the dams would be the figure you would want to arrive at. In other words, I wouldn't want to say 5,000 second-feet or 10,000 second-feet. I would say that the flow would be controlled at some point where it would not endanger downstream interests.

The next and last, and most important problem on the river, is the control of sediment. The dam at Abiquiu and the one completed

at Jemez certainly have had considerable effect. However, those two dams control less than one-half of the silt that is now going through the middle valley and the river each year, the average flows.

The CHAIRMAN. Which has contributed most? Salado?

Mr. BALL. Salado and Rio Puerco south of Albuquerque; north of Albuquerque the Rio Galisteo and the Jemez were the biggest silt contributors. Now the Jemez has been controlled.

The CHAIRMAN. So there is some justification for the determination of the engineers for the Galisteo?

Mr. BALL. Yes, sir. When the dam was built at Abiquiu first instead of low Chamita, they lost some of the sediment-control benefits on the Chamita watershed that they would have had from the high dam at Chamita. That, of course, could be corrected with the lower dam near Cochiti, or with the construction of the low dam at Chamita sometime in the future.

The problem facing the district is that with the present controls, when the presently authorized project is completed, we estimate that it costs us between $350,000 and $400,000 each year for the handling of the sediments and silt that collect in the canals and drains of the conservancy district. That is actual figures we are spending each year, Senator.

And we see no hopes for any reductions in those costs unless this bill, S. 2975, is authorized for the construction of the proposed works.

I want to thank you and the committee for the consideration you have always given the conservancy district, and to assure you of our cooperation with the governmental agencies. They said that we had cooperated with them this morning. I think one of the main reasons is that they have cooperated with us, and we appreciate it, Senator.

The CHAIRMAN. I see John Thompson smiling.

Mr. BALL. We get along together pretty good, Senator.

The CHAIRMAN. Thank you.

Mr. Louis A. Scott?

STATEMENT OF LOUIS A. SCOTT, RIO GRANDE COMPACT COMMISSIONER, TEXAS

Mr. SCOTT. Mr. Chairman, you recalled the name of Mr. Dixon, of the Texas Board of Water Engineers. He will not be able to be here.

The CHAIRMAN. I understand he will not be able to be here.

Mr. SCOTT. I have a prepared statement, Senator Chavez. It isn't long, if you prefer to listen to it.

The CHAIRMAN. I prefer to listen to it, to get the whole gist.

Mr. SCOTT. My name is Louis A. Scott. My address is 1100 First National Building, El Paso, Tex., and I am Rio Grande Compact Commissioner for Texas.

If we have a correct understanding of the purpose and intent of S. 2975, it is to authorize the completion of all portions of the middle Rio Grande project as contained in the Flood Control Act of 1948 and as recommended by the Chief of Engineers in his report dated April 5, 1948, as set out in House Document No. 243, 81st Congress, 1st session.

The CHAIRMAN. And its basic intention is not to hurt anyone, any neighbor who might be entitled to a gallon of water.

Mr. SCOTT. This being true, the principal project involved would be the construction of Chiflo Dam and Reservoir on the main stem of Rio Grande a short distance below the Colorado-New Mexico State line, as all other projects authorized by the Flood Control Act of 1948 have been completed or are under construction with the exception of the Bluewater Floodway on Bluewater Creek. Texas is opposed to legislation authorizing the construction of Chiflo Dam. Some of the reasons for our opposition will be stated.

By resolution adopted June 28, 1956, the Committee on Public Works, United States Senate, directed the Corps of Engineers to conduct a review of the report on Rio Grande and tributaries, New Mexico, as published in House Document No. 243, 81st Congress, 1st session, to determine whether any additions or modifications should be made in the recommendations contained therein.

Pursuant to the resolution mentioned the Corps of Engineers has conducted such a review, but has not completed all work in connection therewith. However, studies and investigations by the Corps have progressed to the point where an interim report is in preparation, and this report is expected to be distributed to other Federal agencies and to the interested States within a few weeks.

On May 1, 1958, the Corps of Engineers released to a limited number to Federal and State agencies, including the Rio Grande Compact Commission, a report or document entitled, "Summary of findings; review survey for flood control, Rio Grande and tributaries, New Mexico: Interim report on main stem of Rio Grande above Elephant Butte Dam."

This report states that the corps will recommend in its interim report certain modifications of the Flood Control Act of 1948, and House Document 243, 81st Congress, 1st session, among them being:

1. The elimination of Chiflo Dam, if we have a correct understanding of what is said in the summary of findings.

2. The construction of Galisteo Dam on Rio Galisteo, near Domingo, N. Mex., about 4 miles upstream from its confluence with Rio Grande.

3. The construction of Cochiti Damon Rio Grande about 30 river-miles upstream from Albuquerque, near Cochiti.

The summary of findings contains the following statements with reference to Chiflo, Galisteo, and Cochiti Dams:

1. Page 2, last sentence in the last paragraph on this page:

Main stem floods pose a major threat to Rio Grande Valley particularly at Albuquerque and vicinity where recent developments in the flood plain warrants an even high degree of protection than could be afforded by a reservoir at the Chiflo site.

2. Page 7, paragraph b:

b. Authorized reservoirs plus Chiflo Reservoir: Chiflo Reservoir would reduce the standard project spring flood to within the capacity of the authorized levees in the middle valley; however, the large uncontrolled drainage area below the reservoir could generate a summer flood considerably greater than the capacity of the existing Albuquerque levees. In addition, the levees throughout the balance of the middle valley would have to be considerably enlarged to provide the desired degree of protection. Therefore, a plan involving Chiflo Reservoir operating in combination with the existing and authorized reservoirs would cost considerably more than a plan in which control of both spring and summer floods could be accomplished by reservoirs.

The CHAIRMAN. That means that while Chiflo could accomplish some flood protection, the tributaries downstream, such as Galisteo and the others, would still be a hazard along the river?

Mr. SCOTT. That is my understanding of it, Senator. Of course, I am no engineer. But we have been told by highly competent engineers that the main sources of floods that become a hazard to the middle valley originate below the proposed site for Chiflo.

The CHAIRMAN. But irrespective of the cost, if you could get flood protection by Chiflo and you had additional flood protection on the Galisteo and the other tributaries of the Rio Grande, wouldn't that be better?

Mr. SCOTT. Senator——

The CHAIRMAN. Or are you just thinking about the money end of it?

Mr. SCOTT. No, I am not thinking about the money end of it. I don't think the money end should be disregarded but I am not thinking solely about that.

The CHAIRMAN. It should not be solely disregarded but it should not be the controlling feature.

Mr. SCOTT. I agree with you wholly on that. The position of Texas is that we don't want to see lives endangered or property destroyed. Protection of lives and property have priority over the irrigation of lands for crops.

The CHAIRMAN. That's right. We learned the hard way through a hurricane. We have always known it is Texas and New Mexico by past floods. But they had to have the death of some 170 persons and millions of dollars of destruction of private property in Pennsylvania, Maryland, New York, and New England. Now they are all yelling for flood protection.

Mr. SCOTT. We would like to see what we think is the most practicable solution.

The CHAIRMAN. And I think you are making a fair statement.

Mr. SCOTT. Quoting from this summary of findings again, on page 8 is this statement:

> Most practicable solution: Comprises all completed and authorized projects except low Chamita Dam with the addition of Cochiti and Galisteo Dams described below.

Then follows a description of these two dams, which I do not set out in this statement.

We believe the above quoted statements from the summary of findings, as well as other statements therein contained which we have not copied in the interest of brevity, warrant the assertion on our part that the Corps of Engineers has found that Chiflo Dam should be eliminated as one of the projects in the Rio Grande Basin, and that the interim report of the corps will contain language to this effect. If requested, the summary of findings will doubtless be furnished to the committee. We respectfully suggest that it be read in connection with other matters that will be considered by the committee.

Because of the developments mentioned, we submit that the committee should not give favorable consideration to authorization for construction of Chiflo Dam until:

1. The Corps of Engineers has submitted its interim report on flood control in the middle valley of the Rio Grande in New Mexico

to other Federal agencies involved, and to the affected States for their study and comments.

2. The interim report together with such comments are submitted to the Chief of Engineers for review by him and by the Board of Engineers for Rivers and Harbors.

3. After review by the last-mentioned officer and Board, the report is formally submitted to the other Federal agencies involved and to the governors of the affected States to obtain their views and recommendations, as required by the Flood Control Act of 1944.

Any other procedure will not only be premature, but contrary to the provisions of the Flood Control Act of 1944.

The CHAIRMAN. The law provides it.

Mr. SCOTT. Yes, sir.

The fact that at this hearing no opposition is expressed by Texas to the construction of the Galisteo and Cochiti Dams, or the other projects mentioned in the summary of findings by the Corps of Engineers, is not to be construed as approval by Texas of any of the projects recommended in such summary. The position of Texas with regard to each of the projects recommended will be made known after submission of reports in compliance with the Flood Control Act of 1944.

Texas does not question the present need for flood protection in certain areas of the middle valley in New Mexico. It is our opinion that this need results from aggradation of the channel of Rio Grande and inadequate levees in these areas. These conditions pose a threat to such areas and make more difficult the delivery of the quantity of water Texas is entitled to receive under the Rio Grande compact.

The CHAIRMAN. We provided a little of that in the building of Abiquiu Dam.

Mr. SCOTT. Yes, sir.

The CHAIRMAN. We did pretty fairly with Texas.

Mr. SCOTT. Speaking of Abiquiu for a moment, we certainly hope the uncontrolled outlet has been put back to stay there. It has been put in and taken out every year. We have had an annual struggle over that. The Senate last week, I think it was, voted to put it back in.

The CHAIRMAN. That's right.

Mr. SCOTT. We hope it will stay put this time.

The CHAIRMAN. We hope it stays put because we don't want to be worrying about Texas, you know. We have enough troubles of our own.

Mr. SCOTT. We sincerely believe that the solution to these problems is in remedying the condition of the river channel and the building of adequate levees rather than constructing more dams. The river and levee work can be accomplished in less time and at far less cost than is involved in the planning, construction, maintenance, and operation of dams and reservoirs.

The CHAIRMAN. Thank you, sir.

STATEMENT OF N. B. PHILLIPS, MANAGER, EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1

Mr. PHILLIPS. My name is N. B. Phillips. I am the manager of the El Paso County Water Improvement District No. 1 with headquarters in El Paso, Tex.

The CHAIRMAN. In order to keep the record straight, you used to be manager of the Elephant Butte Irrigation District in New Mexico?

Mr. PHILLIPS. Yes, sir.

The CHAIRMAN. You did a good job.

Mr. PHILLIPS. Thank you, sir.

The CHAIRMAN. Why you had to go to Texas is beyond me.

Mr. PHILLIPS. Thank you again, sir.

It would have been just merely a repetition of the thoughts of El Paso County Water Improvement District No. 1 had I prepared a written statement, which I have not done. I concur, and of course assisted in a small way in the preparation of the report just given by the Rio Grande Compact Commission for the State of Texas.

In every respect I endorse what is contained in this report.

I would like to say, too, that there was a statement made here by Mr. Steve Reynolds, State engineer for New Mexico, this morning, a part of which I mostly concur in, and that is the statements that he made—and I thought that he made them very well—regarding the necessity for levee protection in the Middle Rio Grande Conservancy District.

I think Mr. Reynolds said—and if he didn't, I will say—that regardless of when and if the main stem or tributary storage is provided for flood control, the most immediate need for flood protection in the Middle Valley, as I see it, is adequate levees. I think that point, regardless of the position of the Corps of Engineers, or anyone else, cannot be too fully stressed.

The CHAIRMAN. I am sure you mean that because you know the middle Rio Grande as well as anything. I am glad you made that statement.

Mr. PHILLIPS. Of course, Mr. Reynolds in his statement said there was a resolution passed regarding appropriations for levee work which is badly needed and should have been accomplished in line with the work the Bureau is doing, at the last meeting of the compact commission— the Rio Grande Compact Commission—in February. And, of course, in order for any resolution to pass that commission it must be unanimous, and it was unanimous.

I think, Mr. Chairman, that that is all that I can contribute.

The CHAIRMAN. Thank you, Mr. Phillips.

We are going to have another meeting tomorrow morning at 9:30, and we will call on the rest of the witnesses. So be ready tomorrow morning at 9:30.

We will start with Mr. Love, and Mr. Cater, and we will hear the other citizens who are here.

We will stand in recess until 9:30 tomorrow morning.

(Whereupon, at 11:57 a. m., the subcommittee was adjourned, to reconvene at 9:30 a. m., Friday, July 11, 1958.)

MIDDLE RIO GRANDE PROJECT, NEW MEXICO

FRIDAY, JULY 11, 1958

UNITED STATES SENATE,
COMMITTEE ON PUBLIC WORKS,
SUBCOMMITTEE ON RIVERS AND HARBORS-FLOOD CONTROL,
Washington, D. C.

The subcommittee met, at 9:30 a. m., in room 412, Senate Office Building, Hon. Dennis Chavez, chairman of the committee, presiding.

Present: Senators Chavez (chairman of the committee), Jordan, and Martin (Pennsylvania).

The CHAIRMAN. The committee will be in order.

Our first witness is Mr. William Cater, of Cerro, N. Mex.

STATEMENT OF WILLIAM CATER, CERRO, N. MEX.

Mr. CATER. Thank you, Mr. Chairman.

The CHAIRMAN. You are from northern New Mexico?

Mr. CATER. Yes, sir.

The CHAIRMAN. The village of Cerro?

Mr. CATER. Yes, sir.

The CHAIRMAN. In Taos County, and within the Rio Grande Basin?

Mr. CATER. Yes, sir. I have been a resident of Taos County for many years and have followed the development of the middle Rio Grande project from its start with a great deal of interest.

My interest in the project comes from my firm belief in proper conservation of our natural resources, as well as the development of our part of the country.

I had rather short notice on the hearing and did not have time to prepare a written statement for the committee, Mr. Chairman, so I will be as brief as possible and I would like to make an oral statement.

The CHAIRMAN. Go right ahead, sir.

Mr. CATER. I followed the original program that was recommended for the development of the Rio Grande and approved it and thought it was a good program. I thought that the priorities that were originally set up were just unreasonable priorities, especially based on a conservation angle.

I have been associated with the soil and water conservation movement in New Mexico for a number of years as chairman of the local soil-conservation district, and vice president of the State association of soil-conservation districts.

So our experience in conservation leads us to believe that the proper approach for the treatment of a stream system begins at the top of the system rather than at the bottom; that if the upper reaches of

the system are treated, then the works that are constructed lower down have protection from the start.

I realize that in this case there were possibly compelling circumstances that justified a departure from this procedure, that construction of levees and channels lower down were necessary for immediate local flood protection. However, I think we shouldn't lose sight of the importance of the protection of the upper reaches of the river basin, and especially the necessity of adequate flood control and stream regulation that is necessary in the main river before the middle valley will have any degree of safety from flood damage.

The CHAIRMAN. You are on the upper reaches of the Rio Grande?

Mr. CATER. Yes, sir.

The CHAIRMAN. And directly east of your area is a mountain range, Sangre de Cristo?

Mr. CATER. Yes, sir.

The CHAIRMAN. They go not only into New Mexico but extend into southern Colorado.

Mr. CATER. They do, sir.

The CHAIRMAN. And generally a heavy snow there.

Mr. CATER. Yes, sir, a heavy snowfall which runs into the Rio Grande Basin.

The CHAIRMAN. The problem, as I understand you see it, is that while it is all right to work on the main channel, the upper reaches of the tributaries and drainage area must get the attention of soil conservation so that it would not do any damage lower down in the channel.

Mr. CATER. That is it, sir.

I had some notes prepared to discuss the importance to the project as a whole and to the lower area of the mainstream, but testimony brought forth yesterday and put in the record seems to indicate that everybody agrees that main-stem protection is necessary.

So with your permission I would like to confine myself to what I think is justification for the Chiflo site.

The CHAIRMAN. I have a lot of respect for engineers and for so-called professionals, but the man who lives with the land does learn something by real, hard experience. So you tell us in your own way. We are very informal at these hearings.

Mr. CATER. When the original recommendations were worked up the engineering features were, I think, quite thoroughly gone into, and the justification of the Chiflo site was accepted both from an engineering standpoint and from a flood-control standpoint.

It appears that other recommendations are presented now, but I feel that there are advantages to the Chiflo site that do not accrue to the other sites recommended, and that these advantages should receive consideration by the committee.

Of course in our area one of our interests which is not entirely important to the engineering angle of this project is the economic condition of the area, and it also deserves some consideration.

Taos County has no new industries, we have no war-defense installations. We are a rural community. So the economic situation is rather bad.

The construction of the Chiflo site would do a great deal to improve the economic conditions of the people in the area that are badly needed. Also there are, aside from the admitted flood-control advan-

tages of Chiflo, I feel that we shouldn't lose sight of the byproducts, shall we say. For instance, the recreation advantages of the Chiflo site.

In this country now the Government, and a lot of people, are spending a lot of money to promote the recreation of our people due to shorter working hours and the high pressure that people are working under, and that has been assessed in the original report, that the recreational advantages of Chiflo site are amiss and that they are not paralleled by such advantages in other sites that are suggested.

The CHAIRMAN. It would also have fish and wildlife.

Mr. CATER. Yes, sir. I have long been a believer that conservation should be provided for in all dams constructed in that region.

Another advantage that I think should receive serious consideration is the production of power. I had for a good many years since the beginning of REA been associated with the local REA cooperative, and I have been a member of the board of the cooperative which generates most of the electric energy used by all the cooperatives in the State of New Mexico.

So through those years I have become acquainted with the power situation and the power needs in our State. They are growing beyond all anticipation. Presently the plant of the generating cooperative in Algodones is completing an addition to their generating plant that will increase its capacity by 50 percent. That is needed now by the growth and demand in the State, and it will be necessary even more in the future.

The public-service company in Albuquerque is presently building a large plant out there and they feel it will be fully loaded by the time it is completed and ready for operation. So demand for power is increasing not only from the increased use of Government installations there but from the, I should say, rather phenomenal growth of our State.

The CHAIRMAN. And the Government has a terrifically large installation at Los Alamos, where the first atomic bomb was assembled. And that is within a very short distance from the Chiflo Dam site.

Mr. CATER. That is right. It is about 40 miles.

It is my belief that since it is admitted that the Chiflo site is the last available power production site in the Rio Grande Basin, it is my belief that we shouldn't overlook that possibility and that in the final accommodation of the site of the main-stem dam the production of power should be given serious consideration, whether it is added to the present project or not, but that in the plan of Chiflo it was so designed that power could be added at a later date without additional cost.

This could be accomplished according to the original report and recommendations without any disparagement or any danger to existing water rights.

There is another advantage in Chiflo. As I recall, in one of the original corps reports it was estimated that proper usage of Chiflo in the storage program of the river should save an estimated 100,000 acre-feet annually through evaporation of seepage that now occurs through the same storage in Elephant Butte Reservoir lower down.

Of course, it is contemplated presently that Chiflo will only be used for flood control. But it has been my experience over the years, Mr. Chairman, that we often are forced to change our minds and change our plans by conditions.

I have read not too long ago, in my files, a copy of the dedication speech of the then Commissioner of Reclamation at the dedication of Elephant Butte Dam a good many years ago.

The CHAIRMAN. That was around 1914.

Mr. CATER. As I recall, it was, sir. In that speech he said that—his words were, in substance—that he thought it quite possible that within the lifetime of some of those who were listening to him, that the efficiency of Elephant Butte Reservoir as a storage reservoir would be greatly depleted, if not entirely lost, unless there was main stream protection provided to hold down the erosion and silting. I think he could see a long way ahead the necessity of a main stream reservoir that would give that protection.

It is conceivable to me that this situation might still occur, and that the people of Elephant Butte District themselves might desire at a later time to use Chiflo as a storage reservoir in connection with Elephant Butte and the storage of their own water. I think things of that kind deserve consideration when you are determining the site that shall be accepted.

The CHAIRMAN. I am of the same opinion, and I am sure that this committee will give the matter most serious consideration.

I want to say this for the benefit of Senator Jordan and—he happens to come from a State where the water problem is not an acute one as it is in our State—when you talk of our little potential power, they have more power in North Carolina, practically as much as Tennessee, and they need it. North Carolina has been industrialized possibly more so than any other State in the South. Of necessity they had to go where there was the most reasonable power. There is no question whatsoever that the most reasonable power is waterpower, if you can utilize it.

So as a whole, Chiflo, in my opinion, should be a must as far as New Mexico is concerned, because it is the only place left where we can produce power. We need power and we are short of power. If we want to dream about growing we must have power.

I want to take you down there some time, Senator.

Senator JORDAN. New Mexico?

The CHAIRMAN. Yes.

Senator JORDAN. I would love to go there. I have been there a number of times but I have never been to any of their dams.

Mr. CATER. Mr. Chairman, I thank you for the opportunity to appear.

The CHAIRMAN. Thank you very much.

Senator Maestas?

STATEMENT OF PHIL MAESTAS, MEMBER, MIDDLE RIO GRANDE FLOOD CONTROL ASSOCIATION, ESPANOLA, N. MEX.

Mr. MAESTAS. I am Phil Maestas, from Espanola, N. Mex. I have been a member of the Board of the Middle Rio Grande Flood Control Association since its inception down at Belen about 11 years ago.

The CHAIRMAN. As a matter of fact, you were one of the originators?

Mr. MAESTAS. One of the originators; yes, sir. I happen to be manager of a small irrigation district back in my hometown, Santa Cruz Irrigation District.

Prior to the introduction, for several years the Reclamation Service and the Corps of Army Engineers made a study of the Rio Grande problem. Mr. Mutz was one of them. If I remember right they finally arrived at what we call the comprehensive plan. The comprehensive plan, if I remember, the Chiflo Dam is one of the projects considered. But in order to pacify things, when Congress passed the middle Rio Grande project, they deleted the Chiflo Dam from the bill.

The CHAIRMAN. Without jeopardy.

Mr. MAESTAS. Without jeopardy; right, Senator.

We have in our area, in Taos County and Rio Arriba County, we have the raw materials. Taos County and Rio Arriba contribute more wool and more lambs for the market—I can honestly say that we contribute a fourth or a fifth of the State's production. We have an abundance of lumber of different kinds. We have plenty of truck farming, garden farming, and so forth, fruits, thousands of bushels of apples, but we have no industry. And the reason why we have no industry in the Espanola Valley is because we have no power.

And when they mention the Chiflo Dam that someday can develop whereby you can produce power, it will naturally bring industry into the Espanola Valley, and when industry comes in there naturally that will raise our standards of living.

As I stated before, Senator, you know better than I do the economic and social structure of our people in that part of the State of New Mexico. The Federal Government owns about 72 percent of the land in Rio Arriba County. The big operators own about 15 percent. And we small boys own about 13 percent.

Our grazing facilities have disappeared and natually we are looking to our industry. Los Alamos has been a great factor in raising our standards there. We have fine, nice homes and better ways of living.

We have depended on flood control. I personally, representing the Santa Cruz Irrigation District back in 1950, and through the Corps of Army Engineers, was able to obtain a project for some riprap jobs below Espanola which protects the Santa Clara pueblo and other lands on the east side of the Rio Grande belonging to the Indians.

The CHAIRMAN. I think you got in to the extent of some $40,000.

Mr. MAESTAS. I think so. We have an application pending right now before the Corps of Army Engineers, with headquarters in Albuquerque, for the channelization of the Santa Cruz River. The last that I heard from the office at Albuquerque was that they transferred the application to the Dallas office, and we hope it matures into reality.

As far as flood control is concerned, I honestly believe that Cochiti will be all right. I feel flood control should be taken care of at the source where it originates. And Chiflo Dam will help us in the Rio Grande Valley. We have thousands of acres there of good farmland, part of which is washed out every year from Velarde to Espanola and all through that area.

The CHAIRMAN. I want to tell you about these folks in this Senator's irrigation district and the little creek itself.

When the Spaniards came there 4 centuries ago, this is the area which they settled. Chamita is only a few miles away from Santa Cruz. They had to exist, so they followed the little creeks where

there was water. And they had been in that area since those days, the descendants of those people, just as you have in North Carolina, Kentucky, Virginia, and West Virginia—the original folks.

It is late to try to do something. But we are glad to have such persons as Mr. Maestas here, who realize the situation and would like to do a little so that they will have a little better living, as we are all trying to do throughout the country.

They are grand people, they are fine people, but they do need the Government. We have neglected them long enough. What Uncle Sam has done for New Mexico as a territory, what they did for 20 years in the Philippines is wonderful, but they were forgotten, isolated in the West.

Senator JORDAN. Why does the Government own such a large proportion of that land out there?

The CHAIRMAN. The origin of that land is this: The derivation of legal title to real property in New Mexico comes from the Spanish kings. They would make a land grant either to a family or a community. That was the original ownership. And they were recognized throughout the Spanish kingdom up until 1822. In 1822 Mexico got its independence. Of course, we were caught there; we didn't participate in it but we were a part of it, so we went to Mexico, and Mexico recognized those Spanish land grants.

Then came Uncle Sam. Uncle Sam recognized those land grants. In the treaty which Uncle Sam made with Mexico, all of the rights of real property were recognized, but they consisted only of a small number, probably about 180 land grants within the State. The rest was public domain, and Uncle Sam took over.

Then came, afterward, the homestead laws, and people commenced to homestead 160 acres and up to four-hundred-some-odd acres of land.

At the moment Uncle Sam owns, I would say, about 58 percent of the entire area of New Mexico. It is not on the tax rolls whatsoever. And that is why we insist that after all Uncle Sam does have a certain responsibility.

Senator JORDAN. He ought to look after his own land, should he not?

The CHAIRMAN. That is right.

Mr. MAESTAS. To go back to the Santa Cruz Irrigation District, Senator, back in 1934 we had a drought similar to what we had in 1956, and we were indebted to the tune of about $475,000 due to the drought. We became insolvent and went into the hands of receivers and our people lost their small plots of land.

Fortunately, the Reconstruction Finance Corporation came in back about 1936 and refinanced the district and financially the district is a going concern now.

The CHAIRMAN. At the time the Reconstruction Finance Corporation was organized under Jesse Jones, I participated in the negotiations.

Mr. MAESTAS. I remember, Senator.

The CHAIRMAN. It is a small but very successful going concern. You ought to see the difference: Nice homes, well taken care of; the acreage of ownership is rather small, but it is theirs. You know you can't get anything stronger than somebody having a piece of property. We are trying to save that idea.

Mr. MAESTAS. May I respectfully request that the committee give a favorable report on the Chiflo Dam in particular, because I am positive that the area where I come from, which is the oldest capital in the United States, Senator, I am sure that they would all enjoy it.

The CHAIRMAN. Another piece of history: Santa Fe, N. Mex., the capital of the State, is only 9 years younger than is St. Augustine, Fla., which is the oldest white community in the United States. But to get to St. Augustine, all you had to do was get on the *Mayflower* or some other boat, the *Santa Maria*, and the sea would take you there.

But to get to Santa Fe, first you would have to land at Vera Cruz—that was the landing place—and then go 2,500 miles to try to get to the place where this man comes from.

Senator Martin. What is the oldest building in Santa Fe?

The CHAIRMAN. San Miguel Church. It is still there.

Senator MARTIN. How old is it?

The CHAIRMAN. I would say San Miguel was built around 1593.

Senator MARTIN. What is the date of the building at St. Augustine? It is not very much older than that.

The CHAIRMAN. That is right. The church, as far as the church is concerned, it is older. St. Augustine I think was 1609. And Santa Fe was about 1614, or thereabouts. At that old church they have a bell cast in Spain before Columbus discovered America.

Senator MARTIN. Those are the things in our country that ought to be preserved. And we ought to encourage the schoolchildren to visit them. It is an inspiration to them. It gives them some idea of the great difficulties in founding this country and settling it. When you speak of 2,500 miles from water to Santa Fe, and the folks had the courage to make that long journey, carrying with them the few necessities of life, it ought to be some inspiration to us in this easy type of life that we now enjoy.

Mr. MAESTAS. As the Senator said, in connection with the history, back in our area we have been under the American Government since 1846, and they didn't start to teach us English until about 1902.

The CHAIRMAN. I wish you gentlemen would look at this map for a moment. This red circle is Espanola, which we have been discussing. That is the Santa Cruz River. There are villages from here [indicating] clear up to the top of the mountain.

This is the Rio Grande that we discussed as the main stem. This is the Chama River that gets into the Rio Grande a few miles north of Espanola.

Thirty-seven years before Plymouth Rock, the first little settlement by the Spaniards was in between those two rivers.

Senator JORDAN. Is this a dam west of Espanola?

The CHAIRMAN. This is authorized, the one we are discussing, Chamita.

The Rio Grande starts in Colorado. That is why they are interested. It is an interstate stream. It starts in Colorado and gets down here to El Paso and follows the Mexico border to Brownsville, Tex.

Do you have anything further, Senator?

Senator MARTIN. I don't have anything.

I want to say publicly that I am so sorry, Mr. Chairman, that I can't remain with you.

The CHAIRMAN. I understand.

Senator MARTIN. We have this reciprocal trade bill up now, and it is very difficult.

The CHAIRMAN. A regular bear cat.

Senator MARTIN. It is a bear cat.

Senator Chavez, I will carefully read all of the testimony and I know very well that you are not going to suggest anything to this committee that is not for the general good of the whole country. I have been very much impressed by looking at this map, and I have been very much impressed with the testimony of the witness who just went off the stand. I will read it carefully.

I want to again say publicly that I know very well that you won't recommend anything that you don't think is for the good of the whole Nation. We have to have flood control and navigation and improve our harbors to make a stronger United States so we can have a wider economy which employs more people at gainful wages and maintains the living standards that we have enjoyed in our country.

The CHAIRMAN. As you know, Senator, I have said it over and over again, I love this committee because it is a construction committee. We don't worry about tariffs or reciprocal trade, but we do worry about navigation and flood control, and rivers and harbors, and the deepening of the St. Lawrence, and Niagara River power, for example.

But that is all construction. While we don't have that kind of rivers, we have so little that we don't dare let go of them.

Senator MARTIN. Along that line, Mr. Chairman, this matter of water is becoming a very serious problem in the eastern part of the United States. Our population has become so dense, in my own State of Pennsylvania, for example, we have over 180 communities of more than 5,000 each. For industry and personal consumption, that requires an enormous amount of water. We are spending, in my State, millions and millions of dollars of our own funds to clear up our streams.

You know we have been dumping the sewage into those streams for pretty nearly 200 years, and it is amazing the results we are getting. The Lord gave us air and water and soil. Now it is up to us to keep the air pure, the water clear, and to keep those wonderful acres of soil in good condition, and then conserve the minerals and other natural resources that we have.

The CHAIRMAN. What good is the Delaware if you can't float a boat?

Senator MARTIN. It isn't worth anything.

The CHAIRMAN. United Steel put up a $500 million plant north of Philadelphia. What good is that if they can't get in a ship with the ore? I have been fair, I think. I have tried to be, to the whole Nation, in our natural resources.

Senator MARTIN. You have helped on that, and I want you to know that we appreciate it very much indeed. When we first started the Delaware deepening there were not very many industries along the Delaware. Now it is getting difficult to get a site for a new industry either on the Jersey or the Pennsylvania side of the Delaware River because they can take their raw material up there most economically.

If you will excuse me, Senator, I must leave.

The CHAIRMAN. I understand.

Senator Jordan has been most faithful.

Senator MARTIN. You people from New Mexico have a grand Senator, and we are all mighty proud of him.

Senator JORDAN. Senator, I have another meeting that I have to attend, also. But I will say that I am very much interested in any flood control and power development and water conservation, because we have that same problem in North Carolina.

Fortunately, the big power companies years ago built their own dams. But we don't have many of them. They are building steam plants now. And we have our own problem to look after.

The CHAIRMAN. That is right. It is nationwide.

Senator JORDAN. It is, and our population has jumped to nearly 5 million people, and we need water badly, too. We have some problems. I am delighted to be on this committee and to be helpful if I can.

The CHAIRMAN. Thank you.

Senator JORDAN. I will go along with your recommendation on anything that you would like me to do, sir.

The CHAIRMAN. Not only that, but let me tell you that Eloise Porter has been here since the days of Josiah Bailey working on the same thing.

Senator JORDAN. And she is a good one.

I am sorry that I must leave but I have another meeting to attend.

The CHAIRMAN. I understand. Thank you.

Senator JORDAN. I will study your reports.

The CHAIRMAN. We won't act on it until every member of the committee reads that report.

Mr. Martinez?

STATEMENT OF ANDRES MARTINEZ, TAOS, TAOS COUNTY, N. MEX.

Mr. MARTINEZ. Mr. Chairman and members of the committee, I am Andres Martinez, from the community of Taos, Taos County, N. Mex. I am a member of the ASC committee. Being a member of this committee I have come to deal with our own people's necessities. I can see the urgent need of these people for more conservation and for more practical uses of water.

I feel that this is a great necessity in authorizing the construction of Chiflo for this region. It will create potential power and will eliminate a tremendous sum of money now being spent in the lower reaches of the valley in protecting works now constructed, and if they are not inadequate, or if they are not permanent and streamflows in the spring are heavy, there will be caused a great destruction to the crops and to the work that has been previously constructed to control these floods.

The storage in the upper reaches of the Rio Grande, referring to the Chiflo Dam, will prevent the destruction of these properties and crops if adequate storage is facilitated.

From the standpoint of potentialities, it will create greater development in industry for the whole State of New Mexico, and it will raise the standard of living of our own people, which is a great necessity. We have to subsist on a very meager ration. It is all on account of not having adequate facilities to raise the standards. For this reason I would urge the construction of Chiflo Dam.

I don't have very much to say on this, but that is the urge of our people, that we will someday have industry there that will create more

occupations for the people, for our own people, in order to keep them from going out of State to look for work.

As it is now, about half of our families, heads of families, have to leave and hunt work, if you will permit me the word, for jobs in other States to sustain their families.

The CHAIRMAN. Were you at Hondo?

Mr. MARTINEZ. Yes.

The CHAIRMAN. Hondo, Colo.?

Mr. MARTINEZ. Yes.

The CHAIRMAN. You had to go there to get some work?

Mr. MARTINEZ. That is right.

I am most grateful for this opportunity, Senator, to present these few remarks for construction of the Chiflo Dam.

The CHAIRMAN. Thank you. We appreciate your statement as much as we did any other witness before the committee.

Mr. MARTINEZ. Thank you.

The CHAIRMAN. Mayor Dailey?

I will leave Mr. Murphy and Mr. Gregg until last, because they are experts.

STATEMENT OF FRANK J. DAILEY, MAYOR, CITY OF SOCORRO, N. MEX.

Mr. DAILEY. Mr. name is Frank J. Dailey and I am the mayor of the city of Socorro, N. Mex. I have a short statement, Mr. Chairman. It is not of a technical nature.

The CHAIRMAN. Why don't you read it?

Mr. DAILEY. All right, sir.

I have been delegated to appear before this committee in support of S. 2975, which calls for modification or additions to the authorized Rio Grande project, Flood Control Acts of 1948 and 1950.

We in the Socorro area have suffered tremendously from sediment and from floods during the past, and while the present work of the Army engineers and the Bureau of Reclamation has helped us considerably, we are fully aware of the fact that we need adequate dams on the main stem of the Rio Grande.

We are also cognizant of the need for dams and reservoirs on the tributaries not as yet treated, such as the Rio Puerco, Rio Salado, Galisteo, and other larger creeks and arroyos.

Strengthening of the present levees is important, but only by adequate dams can we ever expect to control the flow of the river, and the most urgent need is for a dam on the main stem of the Rio Grande.

We hope this committee will grant our request for the fulfillment of the full program for flood control in the middle Rio Grande Valley, and we join with the other witnesses here today who are seeking the authorization of this essential construction.

I thank you for the privilege of appearing here today.

The CHAIRMAN. Mayor, you had a flood around Socorro just a short time past. When was it? Two or three years ago?

Mr. DAILEY. Yes, sir. We had floods 3 years ago.

The CHAIRMAN. It wasn't caused necessarily by the Rio Grande, but by the arroyos surrounding the city?

Mr. DAILEY. Yes, sir; that is correct.

The CHAIRMAN. There was quite a little property loss. Luckily, we had no lives lost but there was considerable property loss.

Mr. DAILEY. Yes, sir; there was.

The CHAIRMAN. Later on, possibly last year, you had a threat of another flood?

Mr. DAILEY. Yes, sir; we did.

The CHAIRMAN. I recall having a phone call from J. P. Crespin, about a woman losing her house, and Mr. Thompson, of the Bureau of Reclamation, sent help, I recall, so there is a need for flood protection around your area.

Mr. DAILEY. There is a very great need for it; yes, sir.

The CHAIRMAN. I thank you, Mayor Dailey.

Mr. DAILEY. Thank you, sir.

The CHAIRMAN. Mr. John P. Murphy?

STATEMENT OF JOHN PATRICK MURPHY, EXECUTIVE SECRETARY, MIDDLE RIO GRANDE FLOOD CONTROL ASSOCIATION

Mr. MURPHY. Mr. Chairman and members of the committee, my name is John Patrick Murphy and I am executive secretary of the Middle Rio Grande Flood Control Association. I have been authorized by the board of directors of this association to appear on their behalf and present their views in support of S. 2975, which calls for modification of the project in order to provide for the completion of the middle Rio Grande portion of that project.

The Flood Control Acts of 1948 and 1950 approved an estimated cost of $42,500,000 for the work to be prosecuted by the Department of the Army and $30,179,000 for the work to be prosecuted by the Department of the Interior. From the year 1950 through 1957 fiscal years, the Congress has appropriated a total of $31,404,889. With the project authorized at $72,679,000, we have now received 43.6 percent of that amount.

It will be noted that the Corps of Engineers originally recommended Chiflo Dam on the main stem of the Rio Grande, but that this units was so strenuously opposed by Elephant Butte district and Texas, that in order to get started on the other units in the project, we compromised, and that explains the wording in the bill that—

> Chiflo Dam and Reservoir on Rio Grande shall be excluded from the middle Rio Grande project authorized herein without prejudice to subsequent consideration of Chiflo Dam and Reservoir by the Congress.

I would like to interpolate there and say that the proponents of S. 2975 are all members of our association, and I am very proud of the testimony that they have given.

Thus, it was the Middle Rio Grande Flood Control Association that again requested authority of the Congress for the Corps of Engineers to review the report on the project with a view to determining whether any addition or modification should be made in the recommendations contained therein at this time.

In making this request, we specifically stated that we felt the other units as authorized were now far enough along to where, in our studied judgment, it is expedient to again seek authorization from the Congress for the construction of a flood-control dam on the main stem of the Rio Grande.

In addition to this, we asked the Congress for further programing of our comprehensive plan. We are all agreed, that if this is truly to be a master plan for flood control and water conservation in the Middle Rio Grande Basin, the Corps of Engineers must still do certain things and conduct further study and research. For instance, we urgently need something in the way of a silt retention dam on the Rio Puerco; some type of permanent treatment on the Rio Salado, Galsteo, Tonque, and other large creeks and arroyos.

It now develops that we have another very serious condition which has us terribly disturbed and worried. It is the failure of the Corps of Engineers to request appropriations for the continuation of the authorized program of levee protection and channel rectification in the Rio Grande Floodway between Cochiti and the Rio Puerco. This particular phase of the Rio Grande project is superimposed over the works of the present middle Rio Grande Conservancy District.

And, ever since construction was first initiated, our association has been working closely with the Albuquerque offices of the conservancy district, the Army engineers and the Bureau of Reclamation and thus we are cognizant of the fact that the corps and the Bureau have coordinated in developing a plan for channel rectification work that conforms to the intent and purposes as authorized.

The CHAIRMAN. Wasn't the basic purpose of the original act that they would work together?

Mr. MURPHY. That is right, Senator.

The CHAIRMAN. It was a dual enterprise.

Mr. MURPHY. That is it. And that is what distresses us.

All of the Bureau of Reclamation's authorized work on channelization and river rectification in the middle Rio Grande project is programed for completion by the end of fiscal year 1960. Successful completion of the channelization work is, of course, dependent upon concurrent construction of work to be accomplished by the Corps of Engineers. It is essential that the two programs be carried on simultaneously because either program by itself will not be completely effective and, if the programs are not coordinated, duplication of work and increased costs will result. This is a joint undertaking of the corps and the Bureau, but we do not understand why, the corps failed to request funds with which to continue this work as authorized by the Congress.

Maybe certain restrictions were imposed on the Washington office, or reevaluation by that office lowered our priority status through lack of having all the essential facts from the Albuquerque district engineer's office. But whatever the reason, we do know that continuation of this work definitely is contemplated by the Corps; however, it is feared by local taxpayers in the Middle Valley—whom we represent—that the corps have not properly considered the timing with reference to the required coordinated efforts of the Bureau of Reclamation.

The CHAIRMAN. I am aware of that. I think your statement is correct. The Army engineers are going to hear further about this matter.

Mr. MURPHY. We sincerely hope so.

The Bureau of Reclamation has informed us that the success of the cooperative program of channelization and levee protection and improvement proposed by them and the Corps of Engineers, respectively,

is dependent upon coordinated performance of the work. In general, the Bureau's portion of the plan consists of defining a channel about 600 feet wide from Cochiti to Bernardo through the use of steel jetties. The Corps of Engineers' plan for levee protection and improvement includes the installation of steel jetties on the outside of bends and other critical points to protect the levees.

These jetty installations are incorporated into the design for the channelization to be performed by the Bureau of Reclamation, so that generally, Bureau jetty installations are necessary only on the inside of bends and in straight reaches. It is essential that the construction be coordinated, so that the channel will be continuous.

The channelization will result in an improved river alinement between levees, and the location of bends will be changed at some points due to the correction of undesirable river meanders. Therefore, the location of part of the levee protective work to be installed by the corps will be changed. For this reason, too, the success of the cooperative plan is dependent upon concurrent performance of the work. The Bureau expects that these control works, over a period of years, will induce the river to erode between the jetties and to deposit sediment back of the jetty lines, thus accomplishing the desired degradation.

The aforementioned is of great importance and should be constructed and finished by fiscal year 1960. However, we all agree that the supreme requirement is for dams with which to control the flow of water and protect the levees and channels.

Therefore, the paramount need in the Middle Rio Grande Valley always was and always will be, a sufficient number of upstream dams. Only by dams can the maximum flow of water be held below the stage at which flood damage begins. Only by dams can the silting and raising of the riverbed be stopped. We must expedite the construction of our dams. The extreme flood danger to the Middle Rio Grande Valley cannot be eliminated any other way as agreed to by the best engineers in our country. Dams are the essential part of the comprehensive plan and of particular importance is an adequate dam on the main stem of the Rio Grande.

The greatest asset of any country is the people. The second most important asset is the land on which they live. The third most valuable asset is the improvements constructed on the land. A conservative value of property at the present date in the Middle Rio Grande Valley is in excess of $500 million; and it is impossible to secure 1 penny's worth of flood insurance to protect this immense investment. The local people realize their danger and have spent millions and millions of dollars trying to alleviate this situation, or at least avert disaster until such time as the Army Corps of Engineers can complete a comprehensive program for flood control in the Middle Rio Grande Valley.

In certain reaches, the channel of the river has been rising at an average rate of 3 to 4 inches a year, with the result that today Albuquerque, Bernalillo, Belen, Socorro, and the Indian pueblos in the valley, as well as farms, highways, railroads, et cetera, are well below river level even during periods of moderate flow.

There are 6,000 Indians living in the Middle Rio Grande Valley, in 9 pueblos. Agriculture is the principal economy of these Indians,

and now their lives, homes, and farms are being seriously threatened, along with their valley neighbors.

New Mexico is also one of the most vital areas in the national defense program. Some of these installations include: Los Alamos Atomic Laboratories, Sandia Atomic Laboratories, Sandia Air Armed Forces special weapons project, Kirtland Air Force Base, Holloman Air Force Base, White Sands missile range installations near Alamogordo, and others, such as industries related to national defense.

If the river were to get out of its channel above Albuquerque it would unquestionably make inoperative in whole or in part, all of the utilities such as telephone, telegraph, water supply, sewage disposal, power and light plants, the railroads, and the highways. This would create a very chaotic situation in Albuquerque and worst of all it would adversely affect the national-defense installations just described.

You are sadly aware, I am sure, of the fact that almost without exception, flood control in the United States has come after disastrous floods, rather than before. Hence, may I respectfully point out that it is possible, depending of course, upon the vagaries of the weather, to save the middle Rio Grande Valley from another disastrous flood, by promptly completing construction of the flood and sediment control dams already authorized, and work diligently to gain authorization for the additional dams which we are pleading for in our testimony before this committee today. Especially for a dam on the main stem of the Rio Grande. Time is of the essence. It is later than we think.

I deeply appreciate this opportunity to appear before this committee in support of our urgently needed additional units to the comprehensive plan for flood control in the middle Rio Grande Valley. And on behalf of the 500,000 splendid, but anxious people whom I represent, I thank you very much for your kind attention.

The CHAIRMAN. Mr. Murphy, you have made a most comprehensive statement concerning the conditions that I know exist. I think so much of your statement that I am going to see that General Itschner personally will be advised and get a copy of this statement.

Mr. MURPHY. Thank you.

The CHAIRMAN. I think he needs it.

Mr. MURPHY. Thank you.

The CHAIRMAN. Mr. John L. Gregg?

STATEMENT OF JOHN L. GREGG, REPRESENTING ELEPHANT BUTTE IRRIGATION DISTRICT, LAS CRUCES, N. MEX.

Mr. GREGG. My name is John L. Gregg and I represent the Elephant Butte Irrigation District which is located in Dona Ana and Sierra counties in south-central New Mexico.

The district contains 90,000 acres of land which are irrigated from the Rio Grande. There are 2,000 water users in the district. This statement is authorized by the board of directors of the district.

The Elephant Butte Irrigation District is naturally interested in all proposed upstream projects on the Rio Grande. We have learned that these projects can have a decided effect upon the flow of the river and upon the time of arrival, as well as the volume, of water that becomes available to us.

This is particularly true during prolonged periods of severe drought that afflict the Rio Grande Basin of New Mexico from time to time and reduce the flow of the river to a fraction of its normal volume. We have just passed through such a period.

We assume that the principal purpose of the bill now under consideration, S. 2975, is to reinstate the proposed dam and reservoir at Chiflo, located near the Colorado-New Mexico State line, or some similar structure. At the time of the original authorization of the middle Rio Grande project in 1948, Chiflo was excluded from the project without prejudice. We understand that it has recently been dropped from consideration by the Corps of Engineers and that other structures located farther south are now favored by the corps.

Also, the original Chamita Dam, at the mouth of the Chama River, which was included in the 1948 authorization, has been dropped in favor of another site farther upstream where a dam is now under construction. The flood-control features of the original middle Rio Grande project were changed to a considerable extent prior to the start of construction.

We are opposed to the construction of additional flood-control dams on the Rio Grande and its tributaries in New Mexico, under the conditions that now prevail along that stream——

The CHAIRMAN. Would that include Cochiti and Galisteo?

Mr. GREGG. It would certainly include Cochiti. There might be some doubt about our position on the dam on the Galisteo. [Continuing:] Because we feel that such structures will tend to deprive us of control over our storage, and will interfere with, and cause depletion of, our water supply, particularly during times of extended drought. The construction of an additional major dam on the Rio Grande will place that stream under almost complete control and will tend to shift storage upstream from existing reservoirs in southern New Mexico.

Downstream areas, such as the Elephant Butte Irrigation District, would then be largely dependent upon releases from flood-control reservoirs for their water supply. This will place those areas in a difficult position, particularly when drought materially reduces streamflow, for two reasons:

First, it is apparently intended to regulate such releases into the middle Rio Grande Valley to as near 5,000 cubic feet per second as is possible; and

Second, such releases are, and will be, subject to heavy diversions and losses while in transit through the middle Rio Grande Valley.

The prospects of obtaining an adequate water supply in the Elephant Butte Irrigation District with the Rio Grande subject to almost complete control; with flood-control reservoir releases reduced to an arbitrary and inadequate volume of 5,000 cubic feet per second, and with no control over diversions in the middle Rio Grande Valley, in addition to the effect of the streamflows, are not satisfactory. This would be particularly true under drought conditions when river flow is substantially reduced throughout the entire Rio Grande Basin.

Our area is no longer effectively protected by the Rio Grande compact, which was originally intended to divide the waters of the Rio Grande among Colorado, New Mexico, and Texas.

The CHAIRMAN. Why? You are getting your full amount that you are allotted under the compact, are you not?

Mr. GREGG. We are occasionally. Not every year; no, sir.

The CHAIRMAN. The compact was so inequitable that if the Lord did not provide rain or snow, we got into debt. Isn't that correct?

Mr. GREGG. I think that is where there is a difference of opinion, Senator.

The CHAIRMAN. Do you think it is fair to blame people for what the Lord himself is solely responsible? Suppose we have no snow or rain in northern New Mexico. Should we get into debt? I am just asking for your opinion?

Mr. GREGG. Senator, our understanding of the compact is that it took those matters into consideration and provided for a division of the low flows as well as for division of the heavy flows.

The CHAIRMAN. I am so glad that they thought about the Lord. Go ahead.

Mr. GREGG. This would be particularly true under drought conditions when river flow is substantially reduced through the entire Rio Grande Basin.

Our area is no longer effectively protected by the Rio Grande compact, which was originally intended to divide the waters of the Rio Grande among Colorado, New Mexico, and Texas.

This instrument was rendered unenforcible by a United States Supreme Court decision in 1957 and there is no immediate prospect of making it an effective source of protection for our water supply.

We recommend a continuation of water salvage measures in the middle Rio Grande area, and particularly an extension of the low-flow channel northward from its present heading at San Acacia, located some 50 miles below Albuquerque. This channel has been responsible for the salvage of considerable water in the area in which it has been in operation for several years.

We suggest that more emphasis be placed upon channel capacity and less emphasis upon flood-control storage in connection with the solution of the flood-control problem in the middle Rio Grande area. We recommend an increase in the controlled river discharge figure desired by the Corps of Engineers from 5,000 cubic feet per second to 10,000 cubic feet per second, and the provision of adequate discharge capacity in dams now authorized, or to be authorized, to make this greater volume possible.

We feel that a discharge figure of 5,000 cubic feet per second will endanger our water supply because of the effect of heavy diversions and river losses through the middle Rio Grande Valley against which, under present conditions, we have little or no protection. There is apparently some doubt as to whether a 5,000 cubic feet per second flow, less diversions and losses en route, will degrade the river channel through the middle Rio Grande Valley in the manner originally considered desirable for the purpose of reducing river seepage losses in that area.

The CHAIRMAN. What you mean by that—and I think you are correct—the district that you represent in the El Paso Water Improvement District, are entitled to so much water. You would like to see these projects constructed so that nothing would interfere with your getting your allotted amount?

Mr. GREGG. That is our primary consideration, that we get enough water to get along.

The CHAIRMAN. I don't think there is anything unfair about that, sir.

Go ahead.

Mr. GREGG. We recommend adequate maintenance for all channelization works and river levees through this middle Rio Grande Valley in order to salvage as much water as possible and to afford maximum flood protection from levee construction.

We feel that the Corps of Engineers has come into the Rio Grande Basin of New Mexico and has assumed control of the river for flood-control purposes without giving adequate recognition and consideration to irrigation interests, particularly those in the southern part of the State. Operation of the river for flood control may not always be consistent with operation for irrigation, particularly under drought conditions where limited flows are interfered with and are made subject to heavier diversions.

In particular, it has always seemed to us that the 5,000-cubic-foot-per-second controlled flow figure which the Corps of Engineers has adopted in connection with its flood-control program in the middle Rio Grande Valley was arrived at without considering the interests of the irrigated areas below Elephant Butte. If this arbitrary figure, which the corps appears to be extremely reluctant to change, results in injury to downstream irrigation interests by depriving them of a portion of their water supply at critical times, it will eventually have to be changed at heavy cost to the Government.

We feel that the Corps of Engineers is making a serious error in subordinating the interests of downstream irrigated areas in its attempt to solve the flood problem in the middle Rio Grande Valley. We believe that the corps should take into consideration the whole picture in the Rio Grande Basin of New Mexico, including irrigation, rather than limit its interest to flood control alone. It would appear that the imposition of flood-control projects upon the Rio Grande in New Mexico that endanger downstream irrigated areas will result in material damage to an important part of the economic base of the State of New Mexico.

The CHAIRMAN. Mr. Gregg, the project was organized as a dual proposition, and the only purpose of the work of the Army engineers is to protect the irrigation features of the Reclamation Bureau. So I think you are correct that they should have considered it, because that is the idea.

When they go to flood control, flood control is not only for the purpose of saving a city from being inundated, but also to protect the levees and irrigation system of the valley.

Wasn't that your original understanding of what they were to do there?

Mr. GREGG. Certainly the protection of the irrigation works and the irrigated areas.

The CHAIRMAN. How can you protect them unless the Army engineers build levees?

Mr. GREGG. That has been one of our most consistent contentions, that more attention be given to the construction of levees and to the enlargement of channel capacity than to the other.

The CHAIRMAN. I am glad to have your views. As I said, I represent the Rio Grande Valley. I want to represent you just as strongly below Elephant Butte as I do the middle Grande Valley.

Mr. GREGG. I appreciate that very much.

The CHAIRMAN. But I do feel that we can work out some kind of a system by which all can be protected. I do not want one acre of land below Elephant Butte to be deprived of their water. But, by the same token, if there is a gallon left north of the dam, I don't believe that you folks would object to us using it in a proper manner.

Mr. GREGG. All we want to do, Senator, is live and let live.

The CHAIRMAN. That is right. And that is the chairman's idea about the matter.

I am glad to have your statement. I will say that before any action is taken, the hearings will have to be printed.

I am proud of the interest taken by the people affected. I have never seen such a unanimity of opinion with reference to trying to settle a problem. Generally, they will let Gregg, Phillips, or John Murphy do the work. But here, as you saw, we are all interested in doing something. We might not arrive at the same conclusions, but the basic idea is the same.

I thank you.

Mr. GREGG. Thank you, sir.

The CHAIRMAN. Mr. Thompson, may I ask you a question?

We have had a pretty wet year this year. And we have experienced quite a large runoff. What has been the experience of your office and your functions in the Rio Grande with reference to the flow as it occurred this year?

STATEMENT OF JOHN C. THOMPSON, BUREAU OF RECLAMATION, ALBUQUERQUE, N. MEX.

Mr. THOMPSON. This runoff this year will be about 1,700,000 acre-feet at Otowi, at the upper end of the valley. That will be 60 to 70 percent above normal. We have had a peak through the valley this year, through the mid-valley—that is through the Albuquerque area, through this area that we refer to as the Rio Puerco-Cochiti reach—a peak flow of about 12,000 second-feet. That was a sustained flow that ran for a week to 10 days. It is these sustained flows that we have trouble with. It is not just a peak flow where it comes up to maybe 10,000 and drops suddenly. A sustained flow is what gives us trouble.

As you know, under our contract with the Middle Rio Grande Conservancy District, we are operating and maintaining that system for them this year. We have been for several years. In fact during a construction period we use funds advanced by the district for that purpose.

Part of their work, part of our work, is looking after these levees that have been completed by the corps and the levees that have had no work done on them for many years.

There is about a 100-mile reach of river in here that has had no work done on it under our present authorizations.

In that reach of river there are about 20 miles of levee, old levees, that were pretty seriously threatened this year. This flow of water,

11,000 to 12,000 second feet, was right level with the top of these levees—not all of the 20 miles of that levee—and to afford some protection we got in there and bladed up the back side of the levee. All we had was in effect a windrow of material about as high as this desk that prevented the river from breaking over.

Other areas along there, last year—thinking back to a year ago—we had 41 places in the river that had to be watched. On those, 21 places had to have emergency work. This year nearly the same number had to have emergency work. Emergency work is expensive. We spent a lot of money of the district that the district advanced. We had our own crews out patroling the levees. Mr. Ball and our crews put in an awful lot of time. The Corps of Engineers had patrolmen out also in some areas.

We managed barely to get by this year. There were any number of circumstances that could have given us more water, but we were just fortunate not to have it.

El Vado Reservoir filled from nearly empty to its full capacity and started spilling. When it started spilling the flow on the Chama had dropped some so we didn't have a peak there. The flow out of Colorado was delayed because it had turned colder. The flow from Taos down, the flow originating in the New Mexico portion of the basin, had had a chance to run off before the Colorado flow hit.

It started raining up there in that watershed area but fortunately none of those storms hit our basin.

The flow out of the Jemez had come out earlier, and the Jemez Reservoir had caught that flow, and it cut down the peak flow. But had anyone of those things not fit just right, we could have had 15,000 to 17,000 second feet or more.

The CHAIRMAN. Nature took care of it.

Mr. THOMPSON. Yes. But that was too close for comfort, and we were worried.

The CHAIRMAN. Mr. Thompson, is it necessary to limit the flow to 5,000 cubic feet per second for correct techniques?

Mr. THOMPSON. Under the present circumstances, under the present condition of the river, where improvements have not been made by the Bureau and the Corps, we were having trouble during flows of only 3,500 cubic feet per second. When flows exceeded 5,000 cubic feet per second we naturally had more trouble.

May I expand on that a little?

The CHAIRMAN. Certainly.

Mr. THOMPSON. Under present conditions, where improvements have not been made, 5,000 cubic feet per second of continuous flow created many problems and is difficult to handle. We did handle 8,000 cubic feet per second. But you have a chance of flows coming in from the arroyos that would put that up.

To carry the thought a little further: Through that prototype reach, the 4-mile reach that we had completed and that had had a chance to function, we very safely passed these flows of 10,000 to 12,000 cubic feet per second through that reach. That is the kind of work that we would like to see done through this whole hundred-mile reach.

The CHAIRMAN. So, hence, how many miles have you now that took care of the maximum flow? What is the mileage around Albuquerque?

Mr. THOMPSON. The Corps of Engineers has completed a section through there of about 17 miles. And then this 4-mile prototype.

The CHAIRMAN. And the finished program will be what mileage?

Mr. THOMPSON. 100 miles.

The CHAIRMAN. So it is the extra ones that are giving you the worry at the moment?

Mr. THOMPSON. Yes, Senator.

The CHAIRMAN. Thank you very much.

Mr. Engel, city manager of Albuquerque, was here yesterday but he had to return to his duties. Therefore we will include his statement in the record at this point.

(The statement is as follows:)

STATEMENT BY EDMUND L. ENGEL, CITY MANAGER OF THE CITY OF ALBUQUERQUE, IN SUPPORT OF SENATE BILL 2975

Mr. Chairman and members of the committe, my name is Edmund L. Engel and I am city manager of the city of Albuquerque, N. Mex. I have been authorized by the Albuquerque City Commission to appear on behalf of the citizens of Albuquerque and present their views in support of Senate bill 2975, which would authorize the completion of works necessary for the original comprehensive plan for flood control in the middle Rio Grande Valley.

This committee knows that the Army engineers recommended a dam on the main stem of the Rio Grande in its master plan as presented to the Congress in 1948, but the downstream water users protested to the point that it was deemed expedient to delate the main-stem dam "without prejudice" to subsequent consideration by the Congress.

The other units of the project as authorized are far enough along now, to where it was thought advisable to again bring up for authorization a dam on the main stem of the Rio Grande.

The riverbed at Albuquerque has risen approximately 40 inches since 1935, and in certain reaches along the river it continues to rise at an annual rate of 3 or 4 inches. The levees are constantly and continually deteriorating from wind, water, and other natural wearing processes from Cochiti to Rio Puerco with the exception of work done by the Army engineers at Albuquerque.

With the higher riverbed and the weaker levees, the same volume of water today, which is a matter of record in past floods, would break through the levees and spread over the valley. The possible damage to railway, highway, telephone, telegraph, radio, water, sewage, pipeline, and other facilities serving national defense and atomic installations in the valley, property, farmlands, and population is beyond calculation.

Present value of property in the Albuquerque area alone lying within the flood plain of the Rio Grande and subject to flood damage is about $275 million.

The coming of a flood awaits only the combination of natural conditions in the main stem of the Rio Grande, which will bring down the river the same amount of water that has come down many times in the past.

The extreme flood danger to the middle Rio Grande Valley cannot be eliminated merely by dams on the Chama River and Jemez Creek. The most highly qualified engineers with the Army Corps of Engineers and the Bureau of Reclamation are in agreement that a dam on the main stem of the Rio Grande is essential and urgently needed in order to assure the control of the maximum waterflow, and to hold the flow below the flood stage.

And only by a dam on the main stem of the Rio Grande in combination with the Rio Grande floodway to be constructed jointly by the Corps of Engineers and Bureau of Reclamation can the present silting and raising of the riverbed be stopped and this process reversed to deepen the river channel.

Thus, on behalf of the citizens of Albuquerque, whom I represent, we urgently request this committee to carefully weigh the evidence and be cognizant of the fact that it is always cheaper to preserve and protect our homes and our economy in the first place, than it is to try to salvage and rebuild after the damage is done. We need your help now.

I thank you for the privilege of appearing before you today, and the opportunity which was mine, to plead the cause of some 200,000 people in Greater

Albuquerque, who not only speak for Albuquerque but who join wholeheartedly in supporting the pleas of those other good citizens to the north and the south of us, whose lives and homes are also endangered.

Again, thank you.

The CHAIRMAN. That closes the hearings. Thank you gentlemen.

(Whereupon, at 11:57 a. m., the subcommittee adjourned.)

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